



Drainage Reports

PRELIMINARY DRAINAGE REPORT

Solitude

Southeast of Happy Valley Road and Pima Road
Scottsdale, Arizona

Prepared for:

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July 2020

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N. Baronas	8/24/2020
Reviewed By	Date

PRELIMINARY DRAINAGE REPORT

SOLITUDE
SOUTHEAST OF HAPPY VALLEY ROAD AND
PIMA ROAD
SCOTTSDALE, ARIZONA

JULY 2020

Prepared By:

Kimley»Horn

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CITIZEN REVIEW & NEIGHBORHOOD INVOLVEMENT REPORT

Solitude by SWD

September 17, 2019

Overview

This Citizen Review Report is being performed in association with a request for a Zoning District Map Amendment from R1-190 ESL to R1-43 ESL on an approximately 20+/- acre site located at the southwest corner of Happy Valley Road and 92nd Street. The proposed project would result in a new luxury, single-family residential neighborhood. This proposal is in conformance with the City's General Plan land use designation of Rural Neighborhoods. This Citizen Review Report will be updated throughout the process.

The entire project team is sensitive to the importance of neighborhood involvement and creating a positive relationship with property owners, residents, business owners, homeowners associations, and other interested parties. Communication with these parties will be ongoing throughout the process. Work on compiling a list of impacted and interested stakeholders and neighborhood outreach began prior to the application filing and will also continue throughout the process. Communication with impacted and interested parties has taken place with verbal, written, electronic, and door-to-door contact.

Community Involvement

The outreach team has been communicating with neighboring property owners, HOA's, and community members by telephone, one-on-one meetings, and door-to-door outreach since June 2019. The outreach team visited **over 100 residential neighbors** to get their feedback on the project. A majority of this feedback was favorable to this proposal. Members of the outreach team will continue to be available to meet with any neighbors who wish to discuss the project. Additionally, they will be contactable via telephone and/or e-mail to answer any questions relating to the project.

Surrounding property owners, HOAs and other interested parties were noticed via first class mail regarding the project. The distribution of this notification **EXCEEDED** the City's 750' radius mailing requirements as specified in the Citizen Review Checklist. This notification contained information about the project, as well as contact information. This contact person will continue to provide, as needed, additional information and the opportunity to give feedback. The notification also contained information regarding a neighborhood Open Houses that was held on September 5, 2019 at the Living Water Lutheran Church for those who wished to learn more about the project. The site and time were posted on an Early Notification Sign on the property.

6 interested people (see attached sign-in sheets) attended the Open House. Most of the attendees were generally supportive of the project. A couple of questions arose about density, lot grading and vehicular access. All questions were addressed at the Open House to the best of our ability and knowledge. The outreach team will continue to be available to respond to any neighbors who have questions or comments. The outreach team has not received any additional questions since the neighborhood Open House.

A vital part of the outreach process is to allow people to express their concerns and understand issues and attempt to address them in a professional and timely matter. Again, the entire team realizes the importance of the neighborhood involvement process and is committed to communication and outreach for the project.

ATTACHMENTS:

Notification Letter
Notification List
Affidavit of Posting
Sign-in sheets

INTRODUCTION

PROJECT DESCRIPTION

This Preliminary Drainage report has been prepared for the proposed Solitude residential development. Solitude is a proposed 20-acre single family residential subdivision consisting of 17 single family residential units. The development will be combined with the adjacent 20-acre subdivision previously called HV91 which is currently under construction. The combined development is intended to be called Solitude would consist of 34 lots on 40-acres.

The zoning case (24-ZN-2017) and preliminary plat (5-PP-2018) for HV91 were approved in 2018. Infrastructure plans for the roadway and drainage facilities (310-19) were approved in 2019 and are currently under construction.

The proposed zoning for the project is R1-43 ESL. The proposed site is located within the City of Scottsdale and falls under the City's Environmentally Sensitive Lands Ordinance (ESLO).

PROJECT LOCATION AND DESCRIPTION

Solitude is located within Section 7 of Township 4 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The development is bound to the west by the existing HV91 development, to the east by the 92st Street to the north by Happy Valley Road, and to the south by an undeveloped parcel of land. (See **Figure 1: Vicinity Map**).

The development is located within one flood zone as shown on Flood Insurance Rate Map (FIRM) panel number 04013C1310L, dated October 16, 2013 (see **Appendix A** for FIRM). The flood zones that pertain to the site are as follows:

“Other Flood Areas” Zone X – “Area 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; areas protected by levees from 1% annual chance flood”

The property is undeveloped natural desert, characterized by braided washes and rock features of varying sizes. Undeveloped desert is also characterized by native desert grasses and brush.

SCOPE OF DRAINAGE REPORT

The HV91 project is permitted and under construction. This report specifically covers the new 20 acres of development for the Solitude project.

This drainage report established the general drainage parameter and criteria for preliminary design. This report provides a hydrologic plan for the development of the site as well as preliminary hydraulic analysis for the washes crossing the site.

All drainage criteria presented in this report will conform to the City of Scottsdale Design Standards & Polices Manual (DS&PM).

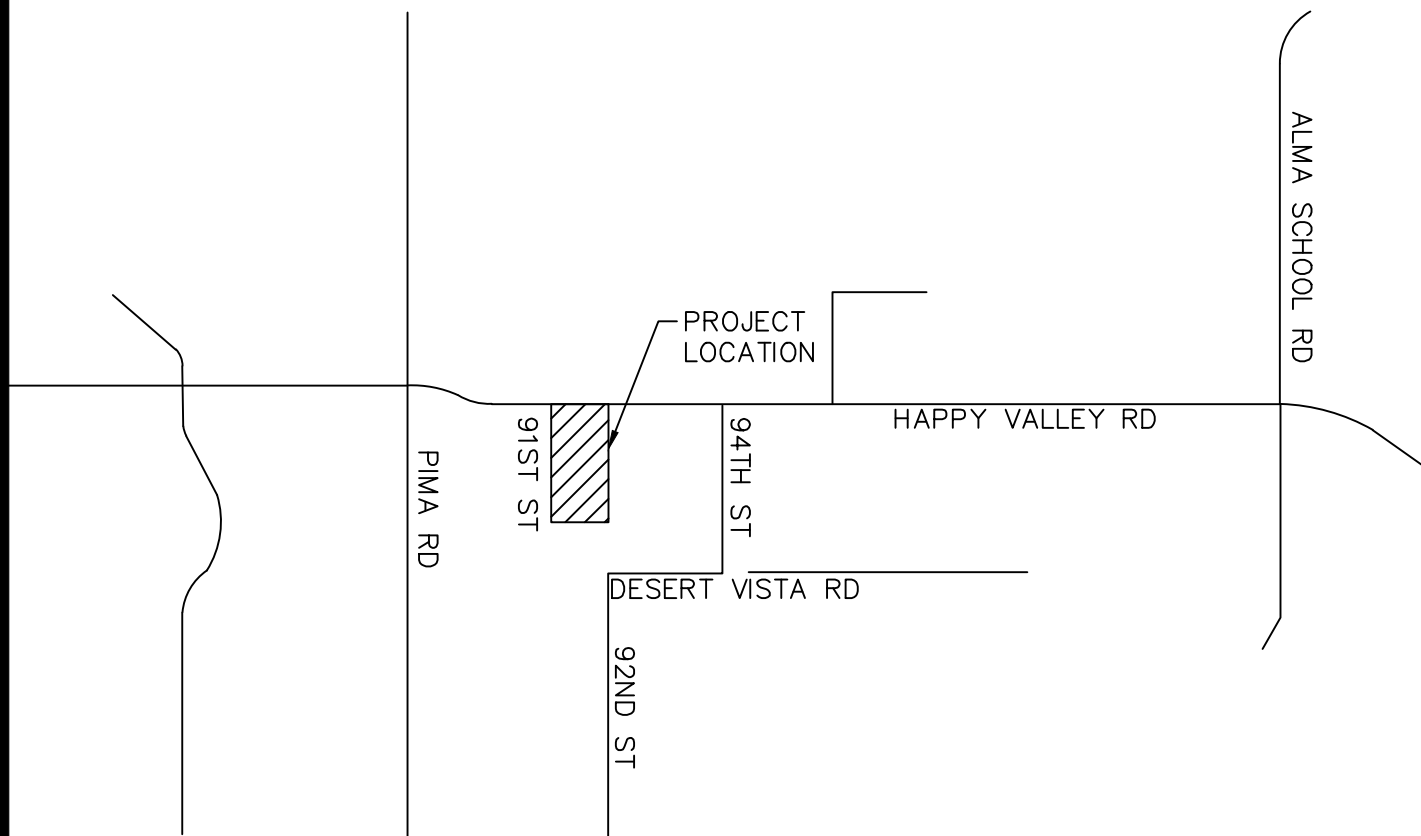


FIGURE 1
VICINITY MAP



DESCRIPTION OF EXISTING DRAINAGE CONDITIONS AND CHARACTERISTICS

EXISTING SITE CONDITIONS

The site is characterized by many washes of varying sizes. The on-site washes vary in size and depth, but generally flow from the northeast to southwest through the site. Storm water runoff impacts the site from the east and north, and is conveyed through the site in existing washes.

The site falls within the City of Scottsdale Environmentally Sensitive Lands (ESL) and is subject to the design criteria of the Environmentally Sensitive Lands Ordinance (ELSO). Specifically, the site is categorized as Upper Desert Landform of ESL. Per the DS&PM “The ordinance requires that a percentage of each property be permanently preserved as natural area open space (NAOS) and the specific environmental features, including vegetation, washes, mountain ridges and peaks be protected for inappropriate development”.

EXISTING OFF-SITE DRAINAGE CONDITIONS

Off-site flows impact the site from the east, and north. Off-site sub-basins north of Happy Valley generally consist of low density residential sub-divisions with some golf course and resort uses. South of Happy Valley Road the sub-basins consist of very low density residential and undeveloped desert uses. The Happy Valley Road section varies between a 2-lane road with shoulder, and a 2-lane road with a median and curb and gutter. Along the north project frontage Happy Valley Road consists of a median divided roadway with curb and gutter.

This report utilized the offsite drainage analysis established with the HV91 drainage report. The existing condition HEC-1 hydraulic model was updated to provide new concentrations points at the eastern boundary of the project along the 92nd Street alignment.

Refer to **Figure 2: Offsite Drainage Map**.

Significant washes are defined as having a 100-year flow of 50 cfs or more. There are no washes with 100-year peak flows of 750 cfs or greater, which indicates that no Vista Corridors exist within the project area. Significant washes have been identified on **Figure 3: Existing Drainage Condition**. Hydrologic results can be found in **Appendix B**.

EXISTING ON-SITE DRAINAGE CONDITIONS

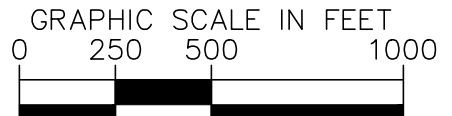
Multiple washes of various sizes and depth cross the site from northeast to southwest. Two of the washes, located at the southeast corner and the north portion of the site, are identified as significant washes with a flow over 50 cfs. Refer to **Figure 3: Existing Drainage Condition**.

An existing conditions hydrologic model was completed to determine the peak stormwater discharges leaving the site. The existing condition discharges will be compared to the proposed condition discharges in a “pre-vs-post” analysis. The concentration points of this pre-vs-post analysis are located on the boundary the eastern boundary of the original HV91 project. While the intent is for Solitude to be one community, the

initial portion of HV91 is under construction, and the drainage facilities have been sized to accommodate the existing flows.

Two significant washes have been identified with Wash A just south of Happy Valley Road, and Wash C located on the southernmost portion of the site. Hydraulic analysis was performed at key cross sections on the significant washes to determine the base flood elevation (BFE).

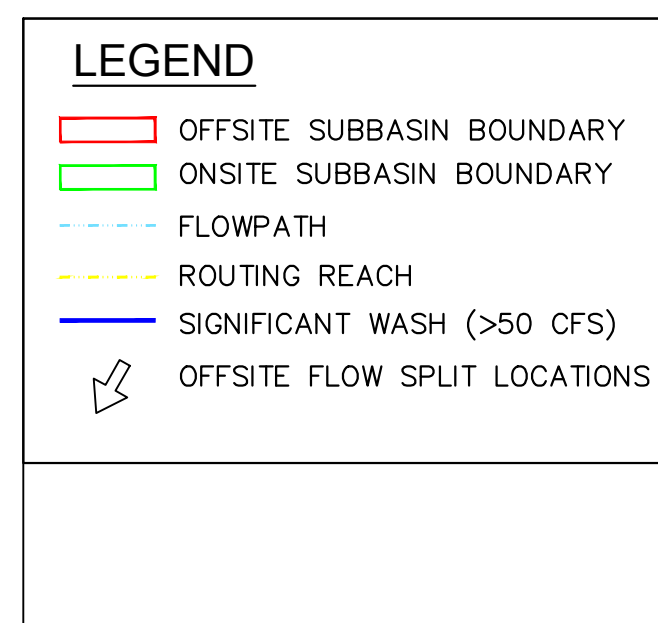
Hydrology and hydraulic results can be found in **Appendix B** and **Appendix C** respectively.



GRAPHIC SCALE IN FEET



A horizontal graphic scale bar with tick marks at 0, 250, 500, and 1000 feet. The bar is divided into four equal segments, each representing 250 feet. The segments are colored black, white, black, and white from left to right.

[illegible]

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GSCALE (H): 1"=500' GSCALE (V): NONE DESIGNED BY: ZJH DRAWN BY: ZJH CHECKED BY: JMB DATE: SEP 2019

PROJECT NO.	291203001
DRAWING NAME	

PROPOSED PRELIMINARY DRAINAGE PLAN

PROPOSED ON-SITE DRAINAGE PLAN

The proposed solitude development consists of an additional 17 single family residential units. Lots located along the washes will have finished floor elevations a minimum of one foot above the 100-year base flood elevation (BFE). In general, lots on the high side of the road (east side) will drain to the street system and runoff will be conveyed in the streets to proposed detention basins. Due to the steep and undulating terrain, lots on the low side of the road will rear or side yard drain into adjacent washes or drainage swales within the development in order to minimize impacts to environmental features, existing natural area open space, and meet design criteria as required with the Environmentally Sensitive Lands Ordinance for the project. Detention basins will be located adjacent to the roadway tract and outside of on-lot building envelopes within designated drainage easements and detain runoff before discharging into the existing washes and will be sized to meet first flush criteria. Post development flows exiting the site will be attenuated through detention basins to a level equal to or less than pre-development flows. See **Figure 4: Proposed Conditions Drainage Map**.

The proposed development is R1-43 ESL zoning. Per this zoning, the development will be constructed in two phases. The first phase consists of the roadway, utilities and infrastructure need to serve the development, include the drainage infrastructure such as the detention basins, channels and culverts. The second phase will be the individual lots and homes. Each lot will require an individual single lot grading plan.

PROPOSED OFF-SITE DRAINAGE PLAN

Off-site flows impact the site from the north and east. Flows will be conveyed through the site and will discharge at their historic locations on the west and south side of the Site. In most cases, off-site flows are conveyed within the existing washes. In some locations, a proposed channel is used to convey the flows through the development. The proposed drainage channels will be designed to maintain a natural appearance as much as possible. Wash C is maintained in the existing natural drainage corridor. Wash A impacts the proposed roadway and must be conveyed in a proposed channel. The proposed channel will connect with the existing channel and culvert designed with HV91. A wash modification will be submitted for the relocation of Wash A.

PROPOSED ON-SITE HYDROLOGY

On-site runoff from the proposed development maintains post-development flows at or below pre-development conditions at each of the concentration points into HV91, for the three design storms (2-year, 10-year, and 100-year). With the exception of one point, CP40, where the 100-year flow is increased by 1 cfs. This is within the level of accuracy of the analysis, and should be considered incidental and in conformance with the design. A summary of pre- and post-development peak discharges is provided in **Table 1**. Multiple detention basins are used to attenuate peak discharge from on-site runoff. Each basin utilizes a bleed-off pipe with orifice plate with the intent to control post-development runoff exiting the development, with a spillway for larger storm events. The total drain time for all basins is less than 36 hours. Refer to **Appendix B** for the detailed hydrologic model results.

Table 1: Peak Discharge Summary

Concentration Point	Prop. Cond. 2-Year (cfs)	Ex. Cond. 2-Year (cfs)	Prop. Cond. 10-Year (cfs)	Ex. Cond. 10-Year (cfs)	Prop. Cond. 100-Year (cfs)	Ex. Cond. 100-Year (cfs)
CP10	30	30	72	72	168	172
CP15	1	1	1	1	2	3
CP20	1	1	1	1	2	3
CP25	1	1	1	2	3	5
CP30	7	7	17	17	38	40
CP35	3	4	7	7	14	15
CP40	2	3	4	6	7	14
CP45	29	29	67	67	156*	155

PROPOSED ON-SITE HYDRAULICS

On-site runoff will be conveyed in the local streets, swales, storm drains, and culverts to the detention basins. Per the DS&PM, all interior streets will be designed to convey the peak discharge from the 10-year storm event at or below the top of curb elevation. Additionally, the streets will convey the 100-year runoff within the proposed tracts and maintain a maximum flow depth of eight inches above the gutter flow line. Catch basins with storm drains or scuppers will capture pavement runoff and outfall to the proposed detention basins. The scupper, catch basins and storm drains will be designed per the DS&PM and FCDMC's Drainage Policies and Standards. Detailed catch basin and street capacity analysis is beyond the scope of this preliminary drainage report and will be completed as part of the final design.

The existing hydraulic cross sections were revised for the proposed condition to determine the 100-year BFE through the property. Development of the site, including roadway, culverts and lots encroach into the existing BFE. The proposed hydraulic model includes these encroachments and modifications to calculate the proposed BFE, which are used to set the adjacent building pads.

Preliminary roadway culverts were designed. The proposed culverts are designed to convey the 100-year storm within the culvert without any roadway overtopping. The two proposed drainage channels were preliminarily designed.

Refer to **Appendix B** for preliminary hydraulic calculations.

Minor flows impact the proposed lots. These flows will be routed around the lots in smaller drainage swales, and at times require culvert driveway crossings. These lot drainage facilities will be included on the single lot grading plans and are not covered in the scope of this report.

SPECIAL CONDITIONS

404 PERMIT/JURISDICTIONAL WASHES

An Approved Jurisdictional Delineation stating no potential water of the US existing on the site was approved with the Army Corp of Engineers (File No. SPL-2019-00519) dated May 29, 2019. No additional analysis or approval is required for the site. **Refer to Appendix D**

EROSION SETBACK ANALYSIS

Erosion Setback Analysis will be performed on the significant washes at the time of preliminary plat and preliminary drainage report. Lots or improvements which encroach into the Erosion Hazard Setback will require a form of erosion protection such as concrete scour wall or launchable rip-rap. The standard minimum 20 foot setback is shown on the Grading and Drainage Plan.

ADEQ WATER QUALITY REQUIREMENTS

Development of the project will impact a large enough area to require a submittal of a Notice of Intent (NOI) to the Arizona Department of Environmental Quality (ADEQ). The NOI will be submitted to ADEQ and an approved NOI certificate with an AZCON number will be provided to the city before approval of any improvement plans.

CULVERT SEDIMENTATION

Sedimentation reduces the hydraulic performance of culverts and can lead to safety, erosion, and maintenance issues. The proposed culverts and storm drains within the project have been designed to minimize sedimentation when possible, as well as providing solutions to reduce the impact of sedimentation. Culverts are designed to match the slope of the existing channel. Additionally, the majority of the culverts are “inlet” control, with flow velocity greater than 10 ft/s. These “self-cleaning” velocities help clear the culverts of sedimentation in larger storm events.

DATA ANALYSIS METHODS

GENERAL DISCUSSION

A detailed hydrologic model was prepared for the existing and proposed site condition. Hydraulic cross sections were prepared for the significant washes that traverse the site. The sections below provide the hydrology and hydraulic methodology.

HYDROLOGY

The U.S. Army Corps of Engineers HEC-1 hydrologic computer program was used to determine the 2-, 10-, and 100-year peak discharges for off-site and on-site flows. HEC-1 models were prepared for the existing and proposed development conditions. The Drainage Design Management System for Windows (DDMSW) program was used to develop the hydrologic parameters for the on-site drainage areas and off-site drainage areas west of the site. Green and Ampt rainfall loss parameters were estimated using DDMSW, the City of Scottsdale parameters, and the Flood Control District of Maricopa County (FCDMC) Drainage Design Manual – Hydrology (Hydrology Manual). Time of Concentration calculations were calculated using DDMSW. Values that show non-default values or out-of-range results are due to the NMN parameter selected for the HEC-1 Model. Because of the varying sub-basin sizes, the selected NMN parameter will not meet the time of concentration requirements specified in the FCDMC Drainage Design Manual - Hydrology for each sub-basin. The HEC-1 models were run with varying NMN parameters to confirm that the hydrograph shape and peaks were valid. The HEC-1 models were prepared using the Clark Unit Hydrograph. Rainfall depth were estimated for the site from the National Oceanic and Atmospheric Administration Atlas 14 (NOAA14).

Six different soil types were identified for the on-site and off-site sub-basins using the web soil survey from the National Resource Conservation Service (NRCS). Web soil survey results are included within **Appendix B**.

Land Use parameters were established for the existing and proposed HEC-1 models. The FCDMC standard land use parameters were used as a basis for the parameters, as well as other recent project is the area. Vegetation cover was set based on a review of aerial photography of the of existing drainage area, taking a typical coverage of a specific land use. A conservative value of 0 percent was used for mountain terrain (UND). Vegetation cover of developed land varies from property to property, a conservative average was used for the overall land use. Vegetation cover is for pervious areas only. RTIMP represents the effective impervious area which is hydraulically connected. RTIMP values for developed land used are based on conservative estimates of connected impervious areas on a typical lot and roadway within the specific land use. Land uses of the existing off-site developments is based on the zoning of the properties and review of existing development as available from aerial photography. See **Table 2** below for complete Land Use Parameters. RTIMP calculations for R1-18 and R1-43 are provided in **Appendix B**. Land use maps for the existing and proposed development conditions are provided in **Appendix B**.

Table 2 Land Use Parameters

Land Use Code	Description	IA	RTIMP	Vegetation Cover
R1-18	Min Lot Size = 13,500 Sq Ft	0.30	27	50.0
R1-43	Min Lot Size = 32,250 Sq Ft	0.30	17	20.0
GOLF	Golf Course	0.44	0	60.0
DESERT	Natural Desert	0.15	0	25.0
UND	Natural Desert S>10%	0.25	0	0

A stage storage and outfall rate calculation spreadsheet was prepared for the proposed detention basins. The stage storage volume is based on end-area calculations at 1-foot intervals. The basin discharge rates through the proposed bleed pipes are calculated from Manning and Orifice equations. Overflow for larger storm events are provided in an overflow weir, which will be sized at final design. Individual basin stage storage and discharge rate tables are provided in **Appendix B**.

HYDRAULICS

100-year BFEs for the significant washes were established using the Bentley Flowmaster V8i computer program. Cross sections were cut for the existing washes at key locations. The cross sections were updated in the proposed condition if they are encroached by a proposed lot. Manning n-value for the channels we estimated from *Chapter 7* of the FCDMC Hydraulics Manual.

Culvert crossing of the significant washes were sized using the Federal Highway Administration HY-8 version 7.30 computer program. Culverts were preliminarily sized to convey the 100-year storm through the structure.

Refer to **Appendix C** for the results of the hydraulic modeling for the existing and proposed condition.

STORMWATER STORAGE METHOD

Stormwater run-off generated by the site is routed to proposed detention basins, located adjacent to the roadway tract and outside of building envelopes on-lot for the development. These detention basins will be located within a designated drainage easement and will attenuate the peak flows leaving the property. Additionally, the basins have been sized to meet first flush requirements of the first half inch of run-off. The existing property is a part of the ESLO. Refer to **Appendix B** for the pre- and post-development hydrologic model results.

CONCLUSIONS

- Hydrologic models were prepared for the on-site and off-site areas for the pre- and post-development conditions. On-site detention basins were sized to ensure that the post-development runoff exiting the site are equal or less than pre-development conditions. Additionally, detention based are sized to meet first flush requirements. Basins are designed to drain within 36 hours and are located within designated drainage easements on-lot and outside of building envelopes proposed with the development.
- Multiple significant washes cross the development. The proposed development will encroach on the washes. Hydraulic models for the existing and proposed conditions were prepared to determine the BFE. The BFE was used to set the finished floor elevations for each lot.
- Significant washes are maintained in their existing corridors or modified with a wash modification application.
- On-site runoff will be conveyed through the local streets and storm drains to the detention basins and wash corridors. Culverts will convey the flow under the new roads. The conveyance facilities will be sized during final design.

REFERENCES

City of Scottsdale, *Design Standards and Policies Manual*, January 2018.

City of Scottsdale, Stormwater and Floodplain Management Ordinance, Chapter 37, July 2016.

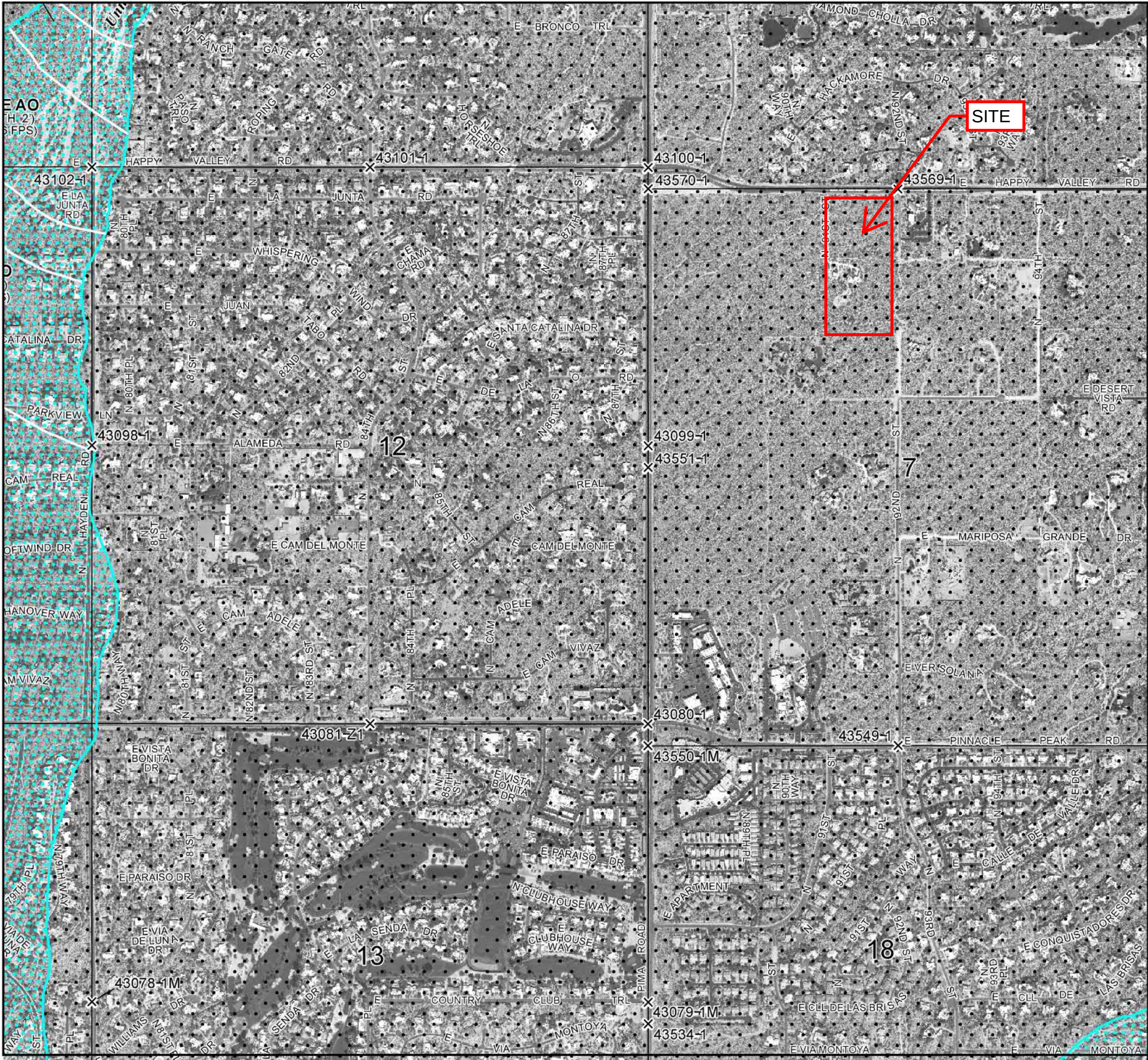
Federal Emergency Management Agency, Flood Insurance Rate Map Panel No04013C1331M, dated November 4, 2015

Flood Control District of Maricopa County, Drainage Design Manual – Hydrology, updated August 15, 2013.

City of Scottsdale Topography Quarter Section Maps.

Final Drainage Report for HV91 dated 05/14/2019, prepared by Kimley-Horn and Associates.

Appendix A – Flood Insurance Rate Map



37 31 000m N
37 30 000m N
37 29 000m N



MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
METE

NFIP

PANEL 1310L

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY,
ARIZONA
AND INCORPORATED AREAS

PANEL 1310 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1310	L
PHOENIX, CITY OF	040051	1310	L
SCOTTSDALE, CITY OF	045012	1310	L

Notice 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
04013C1310L
MAP REVISED
OCTOBER 16, 2013
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix B – Hydrology

HEC-1 Exhibits (Existing and Proposed Conditions)

- HEC-1 Schematic Map
- Soils Map
- Land Use

DDSMW Output: (Existing and Proposed Conditions)

- Rainfall
- Land use
- Soils
- Storage
- Routing

HEC-1 Output

- Existing Condition
- Proposed Condition

Existing Condition

City of Scottsdale
Drainage Design Management System
RAINFALL DATA
Project Reference: SOLITUDE EX

Page 1

9/25/2019

ID	Method	Duration	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
DEFAULT	NOAA14	5 MIN	0.295	0.398	0.476	0.579	0.657	0.735
	NOAA14	10 MIN	0.450	0.606	0.724	0.881	0.999	1.119
	NOAA14	15 MIN	0.558	0.751	0.898	1.092	1.239	1.387
	NOAA14	30 MIN	0.751	1.012	1.209	1.471	1.669	1.868
	NOAA14	1 HOUR	0.929	1.252	1.496	1.820	2.065	2.312
	NOAA14	2 HOUR	1.067	1.416	1.683	2.044	2.317	2.598
	NOAA14	3 HOUR	1.137	1.481	1.756	2.137	2.438	2.750
	NOAA14	6 HOUR	1.342	1.705	1.995	2.392	2.703	3.024
	NOAA14	12 HOUR	1.587	1.995	2.319	2.758	3.094	3.441
	NOAA14	24 HOUR	1.919	2.497	2.963	3.622	4.153	4.715



City of Scottsdale
Drainage Design Management System
SUB BASINS

Page 1

Project Reference: SOLITUDE EX

7/29/2020

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
OFF10	0.900	3.21	245.5	237.0	Natural	0.034	0.30	0.28	5.58	0.231	21	Tc (Hrs)	0.766*	0.749*	0.671*	0.594*	0.550*	0.515 *
												Vel (f/s)	6.15	6.29	7.02	7.93	8.56	9.14
												R (Hrs)	0.743	0.724	0.642	0.560	0.514	0.478
OFF15	0.003	0.12	176.5	176.5	Natural	0.076	0.15	0.37	6.54	0.140		Tc (Hrs)	0.238	0.233	0.209	0.185	0.171	0.161
												Vel (f/s)	0.74	0.76	0.84	0.95	1.03	1.09
												R (Hrs)	0.379	0.369	0.327	0.285	0.262	0.244
OFF20	0.008	0.21	184.0	184.0	Natural	0.070	0.15	0.37	6.54	0.140		Tc (Hrs)	0.298	0.291	0.261	0.231	0.214	0.201
												Vel (f/s)	1.03	1.06	1.18	1.33	1.44	1.53
												R (Hrs)	0.435	0.423	0.375	0.327	0.301	0.281
OFF30	0.036	0.71	204.2	204.0	Natural	0.054	0.19	0.32	6.54	0.138	4	Tc (Hrs)	0.453*	0.443*	0.398	0.354	0.329	0.309
												Vel (f/s)	2.30	2.35	2.62	2.94	3.17	3.37
												R (Hrs)	0.778	0.758	0.672	0.590	0.545	0.509
OFF35	0.031	0.80	147.5	147.5	Natural	0.052	0.20	0.31	6.54	0.138	5	Tc (Hrs)	0.519*	0.508*	0.456*	0.406	0.378	0.355
												Vel (f/s)	2.26	2.31	2.57	2.89	3.10	3.31
												R (Hrs)	1.084	1.056	0.937	0.824	0.761	0.711
OFF40	0.004	0.15	179.3	179.3	Natural	0.037	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.166	0.163	0.147	0.133	0.125	0.118
												Vel (f/s)	1.33	1.35	1.50	1.65	1.76	1.86
												R (Hrs)	0.258	0.251	0.226	0.201	0.187	0.176
OFF45	0.081	0.95	194.1	194.1	Natural	0.037	0.26	0.29	5.46	0.212	12	Tc (Hrs)	0.442*	0.432*	0.392	0.349	0.324	0.303
												Vel (f/s)	3.15	3.23	3.55	3.99	4.30	4.60
												R (Hrs)	0.601	0.586	0.526	0.463	0.425	0.396
OFF50	0.001	0.08	187.5	187.5	Natural	0.041	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.126	0.124	0.112	0.101	0.095*	0.090 *
												Vel (f/s)	0.93	0.95	1.05	1.16	1.24	1.30
												R (Hrs)	0.253	0.247	0.222	0.198	0.184	0.173
ON10	0.011	0.15	145.7	145.7	Natural	0.068	0.15	0.37	6.54	0.140		Tc (Hrs)	0.267	0.261	0.234	0.207	0.192	0.180
												Vel (f/s)	0.82	0.84	0.94	1.06	1.15	1.22
												R (Hrs)	0.245	0.238	0.211	0.184	0.170	0.158

* Non default value or value out of range

(stSubBasCG.rpt)

17-ZN-2019
8/5/2020

City of Scottsdale
Drainage Design Management System
SUB BASINS
Project Reference: SOLITUDE EX

Page 2

7/29/2020

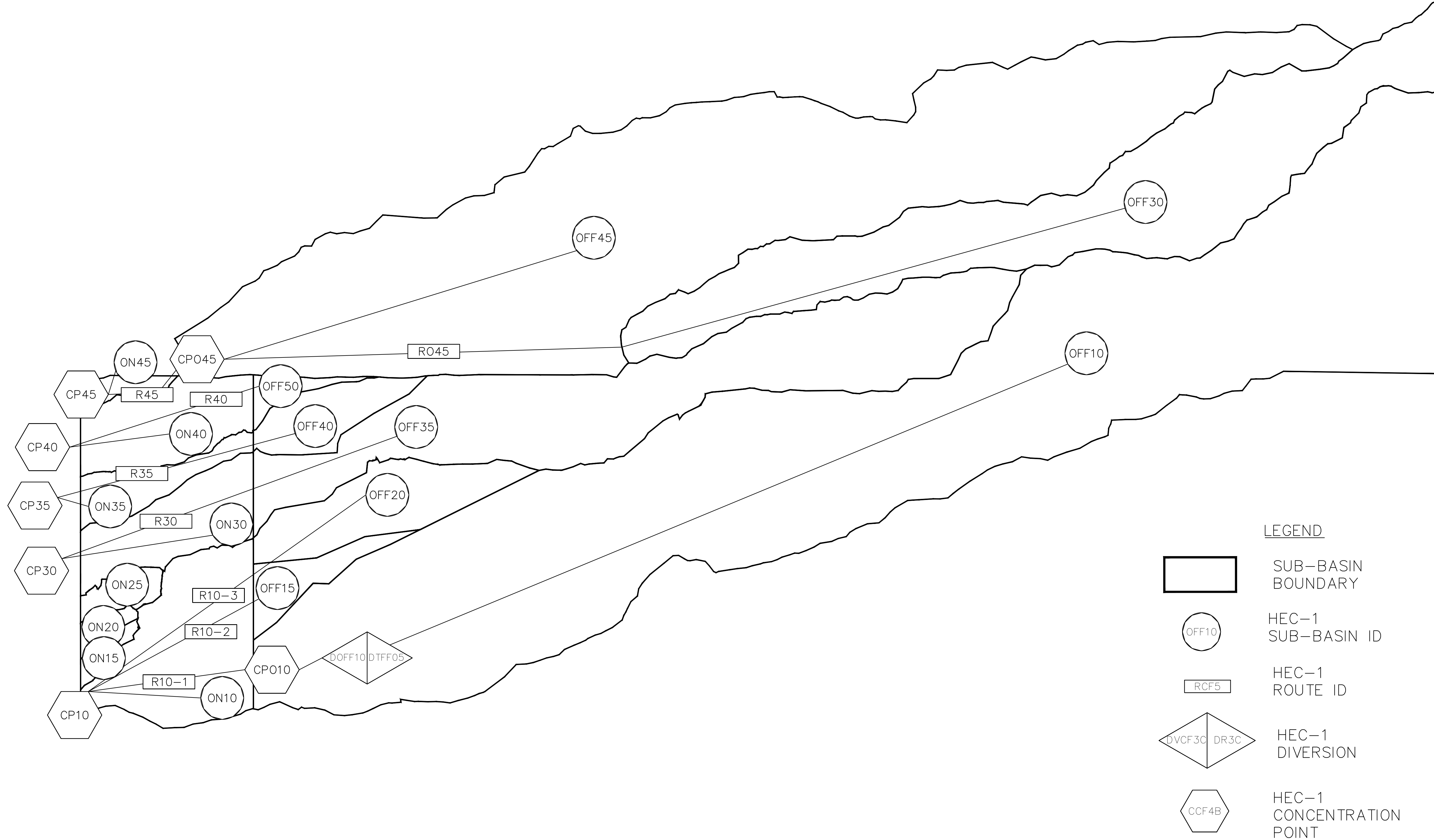
Area ID	Sub Basin Parameters						Rainfall Losses					Return Period Parameters						
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr	
Major Basin ID: 01																		
ON15	0.001	0.05	434.0	294.1	Natural	0.083	0.15	0.37	6.54	0.140	Tc (Hrs)	0.138	0.134	0.120	0.106	0.099*	0.093 *	
											Vel (f/s)	0.53	0.55	0.61	0.69	0.74	0.79	
											R (Hrs)	0.191	0.186	0.165	0.144	0.132	0.123	
ON20	0.001	0.05	434.8	294.2	NATURAL	0.083	0.15	0.37	6.54	0.140	Tc (Hrs)	0.138	0.134	0.120	0.106	0.099*	0.093 *	
											Vel (f/s)	0.53	0.55	0.61	0.69	0.74	0.79	
											R (Hrs)	0.191	0.186	0.165	0.144	0.132	0.123	
ON25	0.002	0.07	219.2	217.5	NATURAL	0.079	0.15	0.37	6.54	0.140	Tc (Hrs)	0.174	0.170	0.152	0.135	0.125	0.117	
											Vel (f/s)	0.59	0.60	0.68	0.76	0.82	0.88	
											R (Hrs)	0.219	0.213	0.189	0.165	0.152	0.141	
ON30	0.006	0.16	147.4	147.4	Natural	0.072	0.15	0.37	6.54	0.140	Tc (Hrs)	0.283	0.276	0.248	0.219	0.203	0.191	
											Vel (f/s)	0.83	0.85	0.95	1.07	1.16	1.23	
											R (Hrs)	0.389	0.378	0.335	0.292	0.269	0.251	
ON35	0.003	0.15	138.2	138.2	Natural	0.076	0.15	0.37	6.54	0.140	Tc (Hrs)	0.288	0.281	0.252	0.223	0.207	0.194	
											Vel (f/s)	0.76	0.78	0.87	0.99	1.06	1.13	
											R (Hrs)	0.558	0.543	0.481	0.420	0.386	0.360	
ON40	0.006	0.15	140.0	140.0	NATURAL	0.072	0.15	0.39	5.85	0.185	Tc (Hrs)	0.289	0.282	0.253	0.223	0.206	0.192	
											Vel (f/s)	0.76	0.78	0.87	0.99	1.07	1.15	
											R (Hrs)	0.378	0.367	0.326	0.283	0.259	0.240	
ON45	0.001	0.08	171.1	171.1	NATURAL	0.083	0.15	0.35	3.29	0.725	Tc (Hrs)	0.274	0.262	0.222	0.193	0.177	0.164	
											Vel (f/s)	0.43	0.45	0.53	0.61	0.66	0.72	
											R (Hrs)	0.598	0.568	0.474	0.405	0.368	0.339	

* Non default value or value out of range

(stSubBasCG.rpt)

17-ZN-2019
8/5/2020

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Kimley»Horn

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7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

SCALE (H): 1"=200'
SCALE (V): NONE
DESIGNED BY: ZJH
DRAWN BY: ZJH
CHECKED BY: JMB
DATE: SEP 2019

**SOLITUDE
EXISTING CONDITION
HEC-1 MAP
SCOTTSDALE, ARIZONA**

PROJECT NO.
291203001
DRAWING NAME

1 OF 1

City of Scottsdale
Drainage Design Management System
LAND USE
Project Reference: SOLITUDE EX

Page 1

9/25/2019

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
OFF10	DESERT	0.0740	8.2	0.15	0	25.0	DRY	0.042	Desert
	GOLF	0.1020	11.3	0.44	0	60.0	NORMAL	0.023	Golf Course
	R1-18	0.5110	56.8	0.30	27	50.0	NORMAL	0.023	Residential 18,000 sq-ft lots
	R1-43	0.0650	7.2	0.30	17	20.0	NORMAL	0.023	Residential 43,000 sq-ft lots
	UND	0.1480	16.4	0.25	0	0.0	DRY	0.081	Undisturbed natural desert or desert landscaping (no impervi
		0.9000	99.9						
OFF15	DESERT	0.0020	100.0	0.15	0	25.0	DRY	0.076	Desert
		0.0020	100.0						
OFF20	DESERT	0.0080	100.0	0.15	0	25.0	DRY	0.070	Desert
		0.0080	100.0						
OFF30	DESERT	0.0260	74.3	0.15	0	25.0	DRY	0.061	Desert
	R1-43	0.0090	25.7	0.30	17	20.0	NORMAL	0.031	Residential 43,000 sq-ft lots
		0.0350	100.0						
OFF35	DESERT	0.0210	67.7	0.15	0	25.0	DRY	0.062	Desert
	R1-43	0.0100	32.3	0.30	17	20.0	NORMAL	0.032	Residential 43,000 sq-ft lots
		0.0310	100.0						
OFF40	R1-43	0.0040	100.0	0.30	17	20.0	NORMAL	0.037	Residential 43,000 sq-ft lots
		0.0040	100.0						
OFF45	DESERT	0.0220	27.2	0.15	0	25.0	DRY	0.056	Desert
	R1-43	0.0590	72.8	0.30	17	20.0	NORMAL	0.029	Residential 43,000 sq-ft lots

* Non default value

(stLuDataCG.rpt)

17-ZN-2019
8/5/2020

City of Scottsdale
Drainage Design Management System
LAND USE
Project Reference: SOLITUDE EX

Page 2

9/25/2019

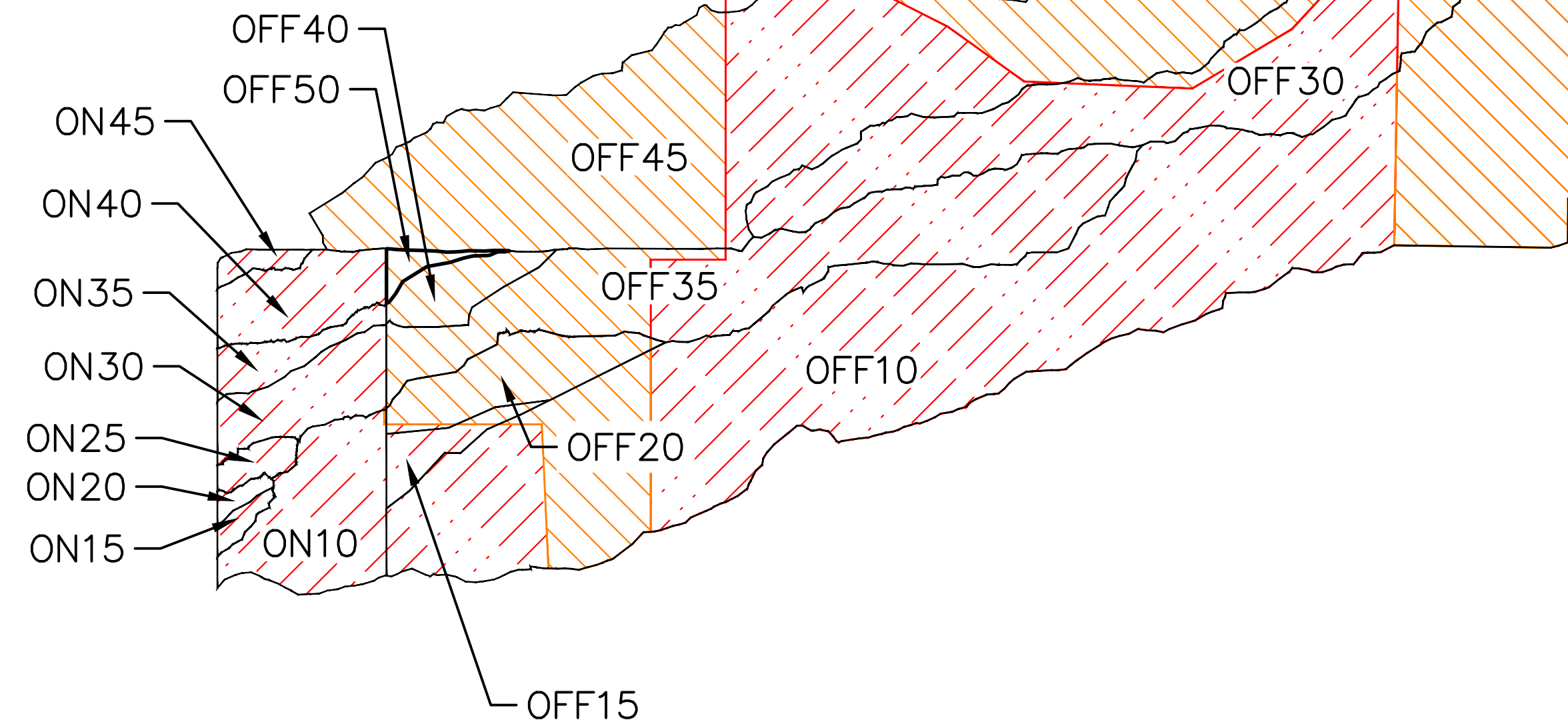
Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0810	100.0						
OFF50	R1-43	0.0010	100.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0010	100.0						
ON10	DESERT	0.0110	100.0	0.15	0	25.0	DRY	0.068	Desert
		0.0110	100.0						
ON15	DESERT	0.0010	100.0	0.15	0	25.0	DRY	0.083	Desert
		0.0010	100.0						
ON20	DESERT	0.0010	100.0	0.15	0	25.0	DRY	0.083	Desert
		0.0010	100.0						
ON25	DESERT	0.0010	100.0	0.15	0	25.0	DRY	0.083	Desert
		0.0010	100.0						
ON30	DESERT	0.0060	100.0	0.15	0	25.0	DRY	0.072	Desert
		0.0060	100.0						
ON35	DESERT	0.0030	100.0	0.15	0	25.0	DRY	0.076	Desert
		0.0030	100.0						
ON40	DESERT	0.0060	100.0	0.15	0	25.0	DRY	0.072	Desert
		0.0060	100.0						
ON45	DESERT	0.0010	100.0	0.15	0	25.0	DRY	0.083	Desert
		0.0010	100.0						

* Non default value

(stLuDataCG.rpt)

17-ZN-2019
8/5/2020

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GRAPHIC SCALE IN FEET

0 250 500 1000

A horizontal scale bar with tick marks at 0, 250, 500, and 1000 feet. The bar is divided into alternating black and white segments. The first 250 feet is white, the next 250 feet is black, the next 250 feet is white, and the final 250 feet is black.

LEGEND



SUB-BASIN BOUNDARY

OFF10 SUB-BASIN ID

LAND USE

 DESERT R1-43 43,000 SF/LOT R1-18 18,000 SF/LOT

GOLF



UND

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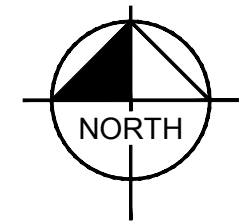
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SCALE (V): NONE
DESIGNED BY: ZJH
DRAWN BY: ZJH
CHECKED BY: JMN
DATE: SEP 2019

**SOLITUDE
EXISTING CONDITION
HEC 1 - LAND USE MAP
SCOTTSDALE, ARIZONA**

PROJECT NO.
001007001

DRAWING NAME

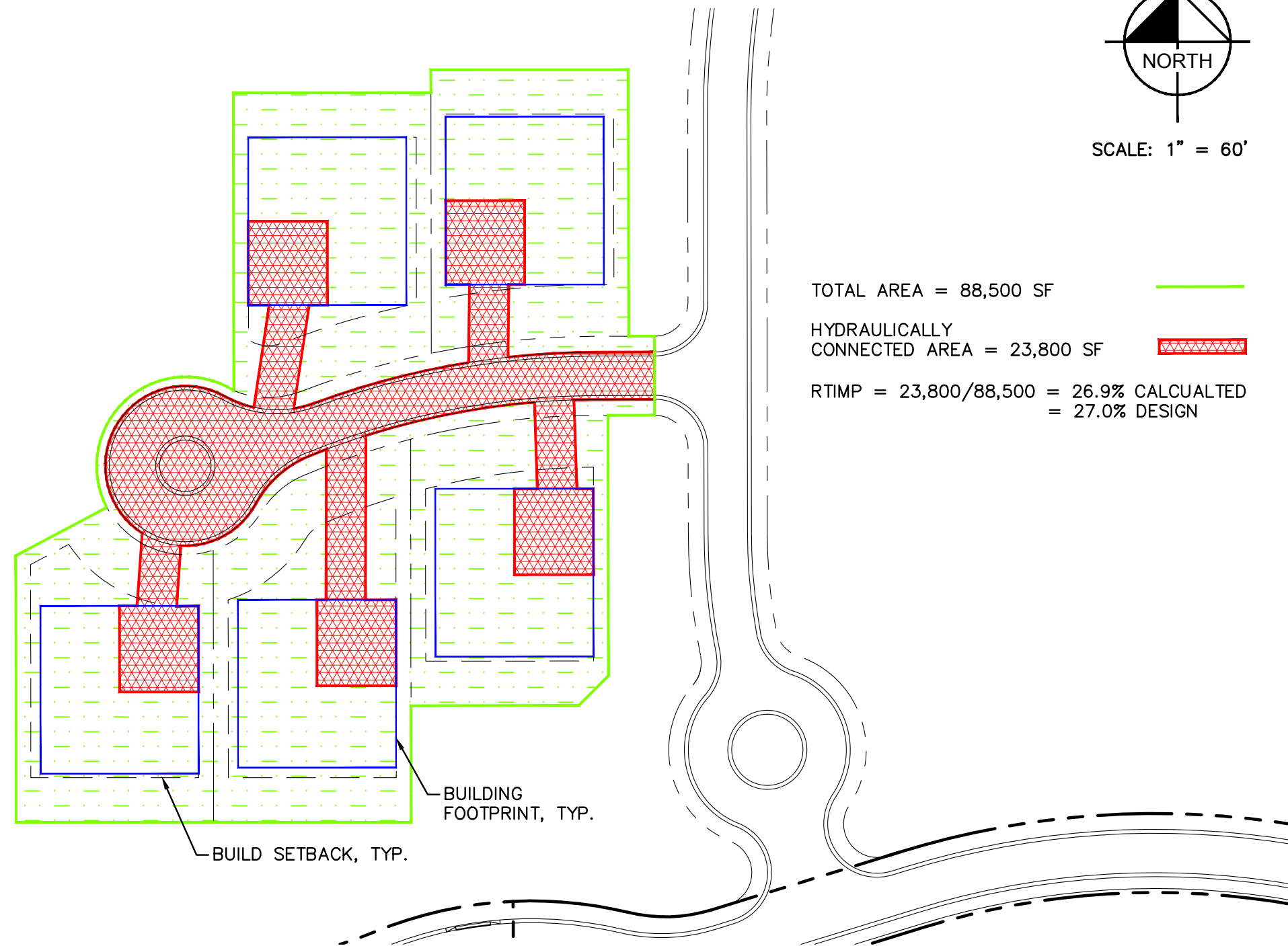
1 OF 1



SCALE: 1" = 60'

TOTAL AREA = 88,500 SF

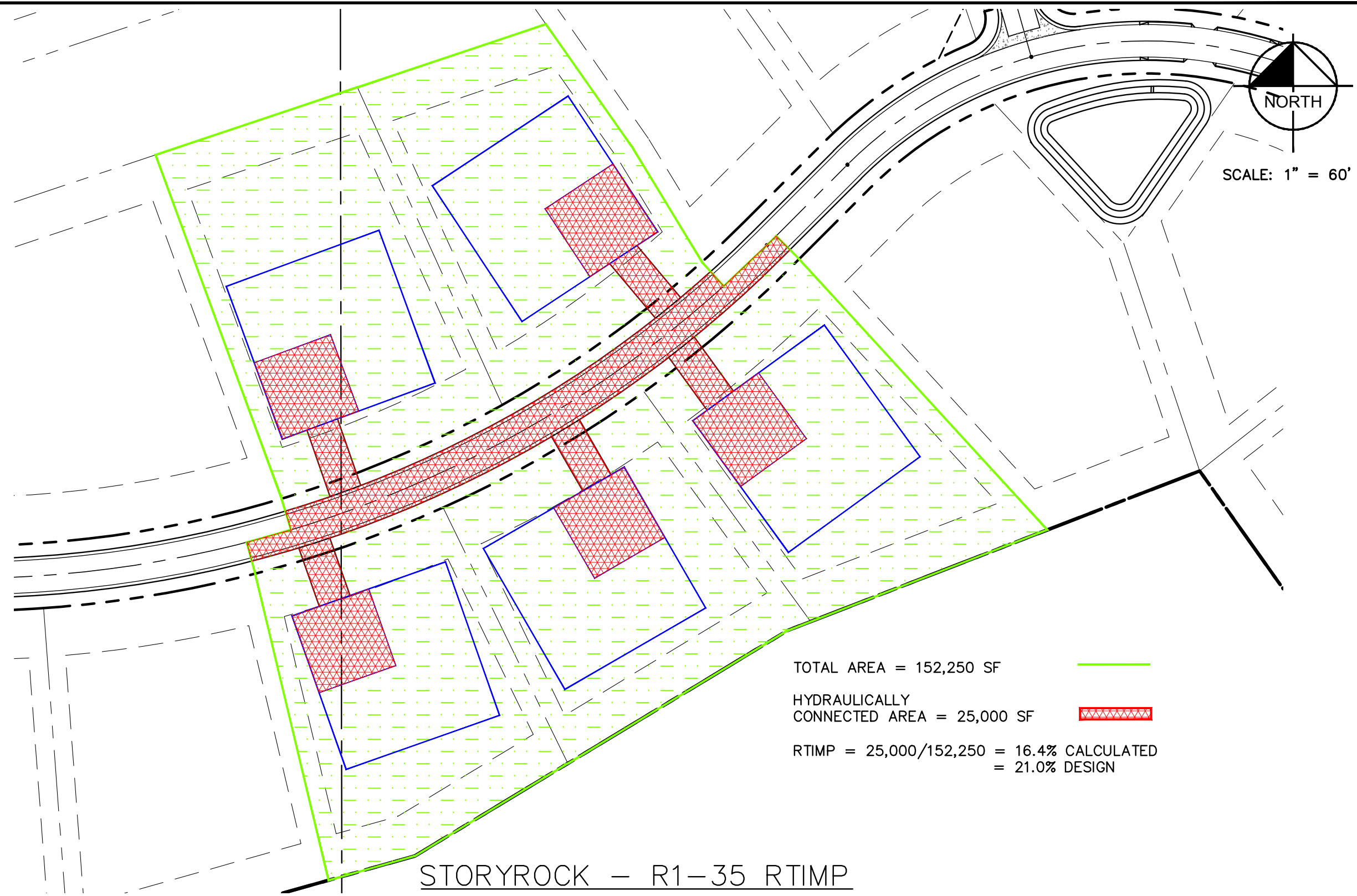
HYDRAULICALLY
CONNECTED AREA = 23,800 SF

$$\begin{aligned} \text{RTIMP} &= 23,800/88,500 = 26.9\% \text{ CALCUALTED} \\ &= 27.0\% \text{ DESIGN} \end{aligned}$$


STORYROCK – R1-18 RTIMP
DETERMINATION

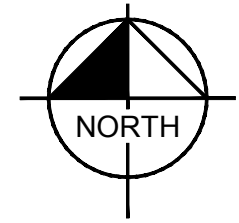
Kimley»»Horn

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TOTAL AREA = 152,250 SF
HYDRAULICALLY
CONNECTED AREA = 25,000 SF
RTIMP = 25,000/152,250 = 16.4% CALCULATED
= 21.0% DESIGN



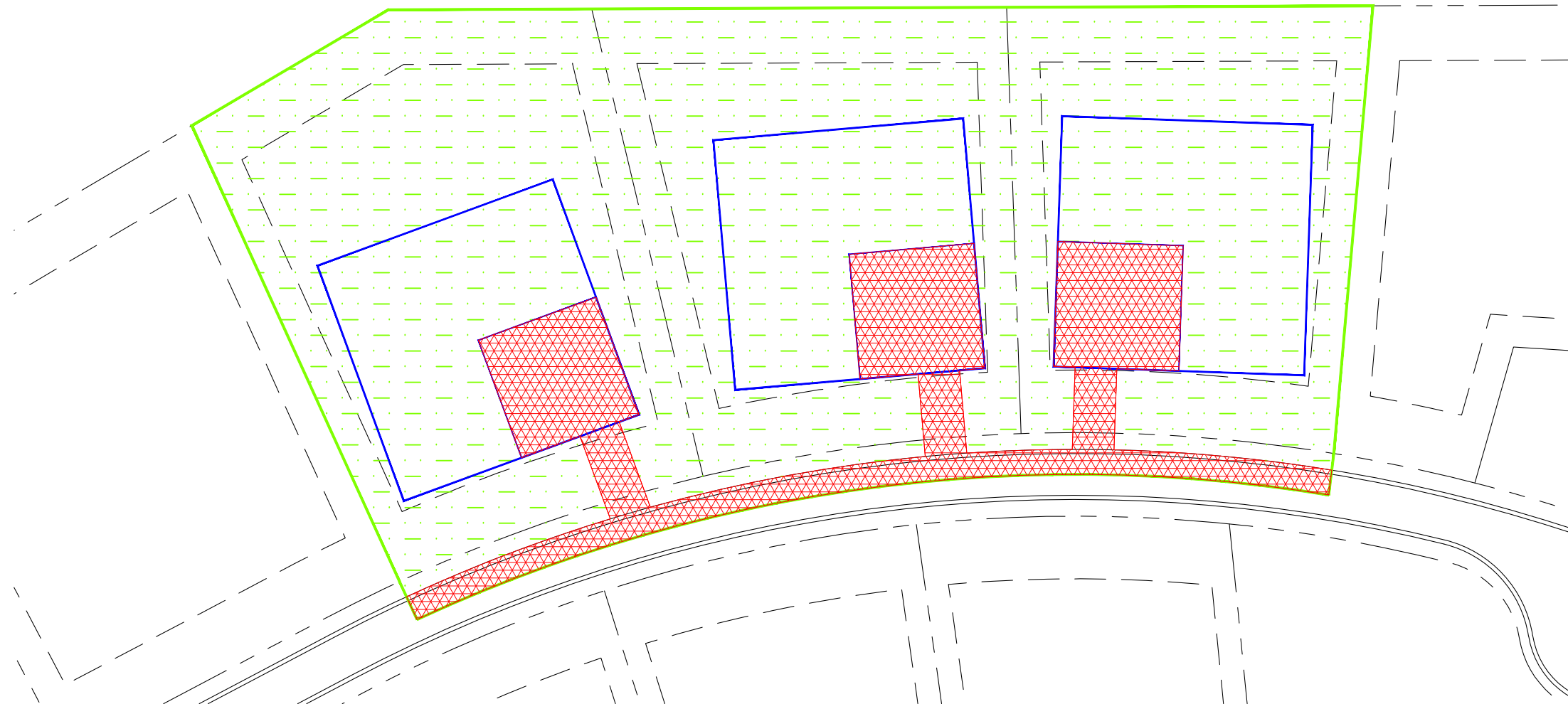


SCALE: 1" = 60'

TOTAL AREA = 123,750 SF

HYDRAULICALLY
CONNECTED AREA = 19,000 SF

$$\text{RTIMP} = 19,000/123,750 = 15.4\% \text{ CALCULATED}$$

$$17.0\% \text{ DESIGN}$$


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City of Scottsdale
Drainage Design Management System
SOILS

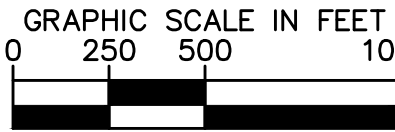
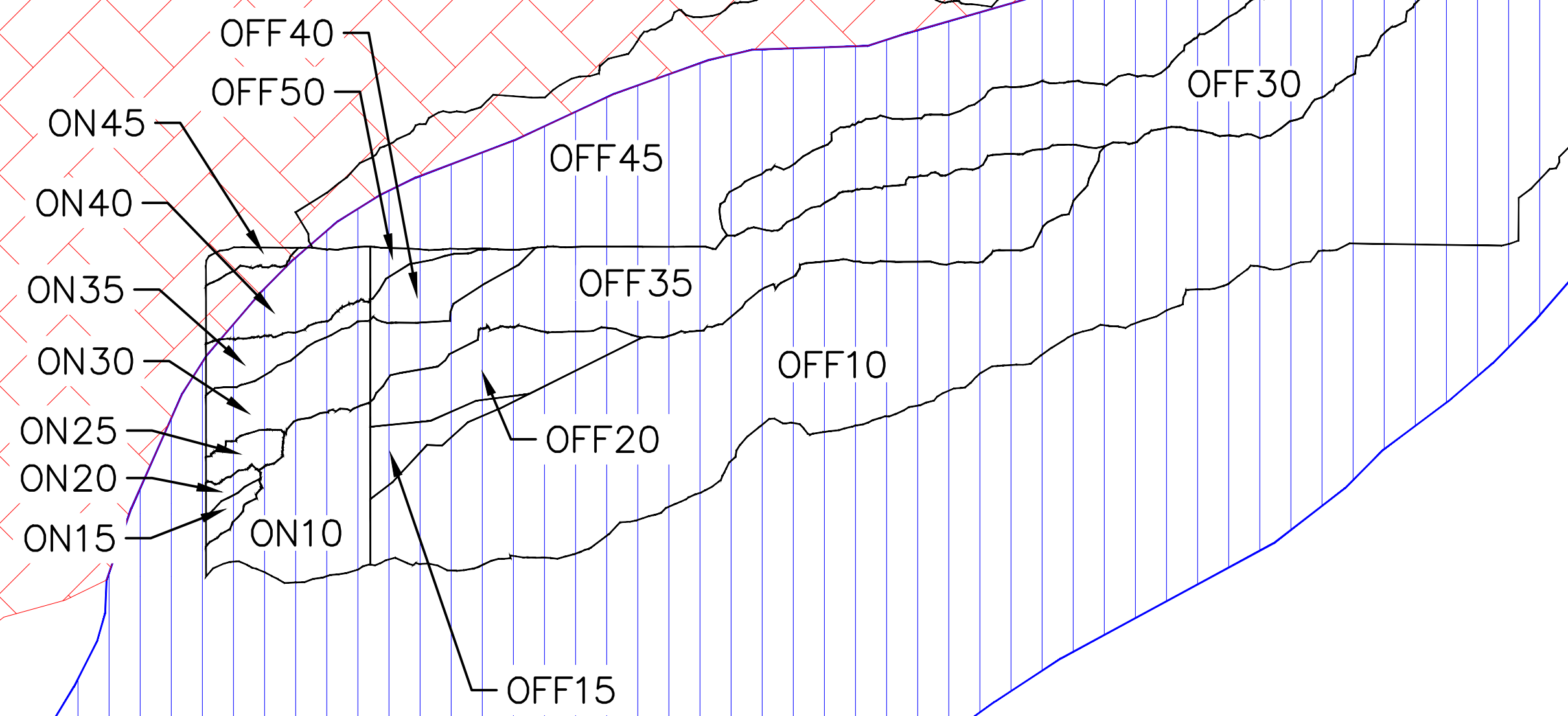
Page 1

Project Reference: SOLITUDE EX

9/25/2019

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
OFF10	645	33	64533	0.165	18.30	0.230	-	100	
	645	61	64561	0.135	15.00	0.150	-	100	
	645	93	64593	0.168	18.60	0.330	-	100	
	645	121	645121	0.259	28.70	0.120	-	100	
	645	63	64563	0.174	19.30	0.140	25.00	100	
OFF15	645	121	645121	0.003	100.00	0.120	-	100	
OFF20	645	121	645121	0.008	100.00	0.120	-	100	
OFF30	645	121	645121	0.036	100.00	0.120	-	100	
OFF35	645	121	645121	0.031	100.00	0.120	-	100	
OFF40	645	121	645121	0.004	100.00	0.120	-	100	
OFF45	645	121	645121	0.059	72.80	0.120	-	100	
	645	6	6456	0.022	27.20	0.620	-	100	
OFF50	645	121	645121	0.001	100.00	0.120	-	100	
ON10	645	121	645121	0.011	100.00	0.120	-	100	
ON15	645	121	645121	0.001	100.00	0.120	-	100	
ON20	645	121	645121	0.001	100.00	0.120	-	100	
ON25	645	121	645121	0.001	100.00	0.120	-	100	
ON30	645	121	645121	0.006	100.00	0.120	-	100	
ON35	645	121	645121	0.003	100.00	0.120	-	100	
ON40	645	121	645121	0.005	83.30	0.120	-	100	
	645	6	6456	0.001	16.70	0.620	-	100	
ON45	645	6	6456	0.001	100.00	0.620	-	100	

K:\EAV_Civil\291203001 - HV92\Drainage\Preliminary\Figures\Ex Solls.dwg Sep 23, 2019 zach.hill



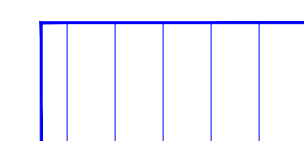
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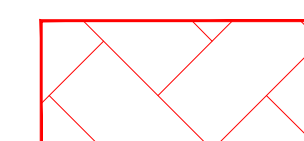
SUB-BASIN BOUNDARY

OFF10

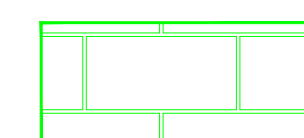
SUB-BASIN ID

SOIL TYPES

121



6

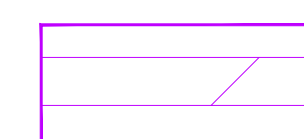


93



63

33



61

SOLITUDE
EXISTING CONDITION
HEC 1 - SOILS MAP
SCOTTSDALE, ARIZONA

PROJECT NO.

DRAWING NAME

1 OF 1

SCALE (H): 1"=500'
SCALE (V): NONESCALE (H): 1"=500'
SCALE (V): NONE

DESIGNED BY: ZJH
DRAWN BY: ZJH

CHECKED BY: JMB

DATE: SEP 2019

Kimley»»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
7740 North 16th Street, Suite 300

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7740 North 16th Street, Suite 300

Phoenix, Arizona 85020 (602) 944-5500

NC

REVISION

BY DATE	APPR
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City of Scottsdale
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: SOLITUDE EX

Page 1

9/25/2019

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
NORMAL DEPTH															
Major Basin 01															
R10-1	0.045	0.045	0.045	800.00	0.0275	-	X:	-	30.00	60.00	65.00	90.00	95.00	110.00	130.00
							Y:	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20
R10-2	0.045	0.045	0.045	930.00	0.0300	-	X:	-	10.00	38.00	40.00	42.00	50.00	60.00	70.00
							Y:	10.00	9.90	9.80	9.00	9.80	9.90	10.00	10.00
R10-3	0.045	0.045	0.045	1,000.00	0.0350	-	X:	-	20.00	23.00	26.00	30.00	40.00	50.00	60.00
							Y:	10.20	10.00	10.00	8.00	10.00	10.10	10.20	10.30
R30	0.045	0.045	0.045	825.00	0.0250	-	X:	-	10.00	20.00	23.00	29.00	33.00	40.00	50.00
							Y:	10.20	10.10	10.00	7.00	7.00	10.00	10.10	10.20
R35	0.045	0.045	0.045	805.00	0.0220	-	X:	-	30.00	35.00	38.00	38.50	41.00	45.00	50.00
							Y:	10.10	10.00	9.90	8.70	9.00	9.90	10.00	10.10
R40	0.045	0.045	0.045	780.00	0.0250	-	X:	-	30.00	48.00	52.00	58.00	60.00	70.00	80.00
							Y:	10.10	10.00	9.90	9.20	9.20	9.90	10.00	10.10
R45	0.045	0.045	0.045	395.00	0.0250	-	X:	-	15.00	20.00	25.00	30.00	35.00	40.00	45.00
							Y:	10.10	10.00	9.00	7.50	8.00	8.50	9.00	9.20
RO45	0.045	0.045	0.045	1,773.00	0.0300	-	X:	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00
							Y:	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90

(stHe1Rt m)

17-ZN-2019
8/5/2020

City of Scottsdale
Drainage Design Management System
HEC-1 DIVERSIONS
Project Reference: SOLITUDE EX

Page 1 9/25/2019

Diversion ID/ DT Card ID	Maximum Volume (ac-ft)	Maximum Diversion (cfs)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
DOFF10		Inflow (cfs)		100	200	500	1,000	2,000	4,000	10,000	20,000	50,000
		Diversion (cfs)		85	170	425	850	1,700	3,400	8,500	17,000	42,500

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:49:42
*
*****
    
```

```

*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
```

```

      X  X  XXXXXX  XXXXX  X
      X  X  X      X      XX
      X  X  X      X      X
      XXXXXX XXXX  X      XXXXX X
      X  X  X      X      X
      X  X  X      X      X
      X  X  XXXXXX  XXXXX  XXX
    
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1

HEC-1 INPUT

PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	City of Scottsdale									
2	ID	SOLITUDE EX - Solitude Existing Conditions Hydrology									
3	ID	2 YEAR									
4	ID	6 Hour Storm									
5	ID	Unit Hydrograph: Clark									
6	ID	Storm: Multiple									
7	ID	07/29/2020									
	*DIAGRAM										
8	IT	2	1JAN99	0	2000						
9	IO	5									
10	IN	15									
	*										
11	JD	1.342	0.0001								
12	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
13	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
14	PC	0.962	0.972	0.983	0.991	1.000					
15	JD	1.334	0.5000								
16	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
17	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
18	PC	0.962	0.972	0.983	0.991	1.000					
19	JD	1.308	2.8								
20	PC	0.000	0.009	0.016	0.025	0.034	0.042	0.051	0.059	0.067	0.076
21	PC	0.087	0.100	0.120	0.163	0.252	0.451	0.694	0.837	0.900	0.938
22	PC	0.950	0.963	0.975	0.988	1.000					
	*										
23	KK	OFF10	BASIN								
24	BA	0.900									
25	LG	0.30	0.28	5.58	0.23	21					
26	UC	0.766	0.743								
27	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
28	UA	100									
	*										
29	KK	DOFF10	DIVERT								
30	DT	DTFF10	0.0	0.0							
31	DI	0.0	100.0	200.0	500.0	1000.0	2000.0	4000.0	10000.0	20000.0	50000.0

32	DQ	0.0	85.0	170.0	425.0	850.0	1700.0	3400.0	8500.0	17000.0	42500.0
	*										
33	KK	R10-1	ROUTE								
34	RS	1	FLOW								
35	RC	0.045	0.045	0.045	800	0.0275	0.00				
36	RX	0.00	30.00	60.00	65.00	90.00	95.00	110.00	130.00		
37	RY	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20		
	*										
38	KK	OFF15	BASIN								
39	BA	0.003									
40	LG	0.15	0.37	6.54	0.14	0					
41	UC	0.238	0.379								
42	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
43	UA	100									
	*										

1

HEC-1 INPUT

PAGE 2

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

44	KK	R10-2	ROUTE								
45	RS	1	FLOW								
46	RC	0.045	0.045	0.045	930	0.0300	0.00				
47	RX	0.00	10.00	38.00	40.00	42.00	50.00	60.00	70.00		
48	RY	10.00	9.90	9.80	9.00	9.80	9.90	10.00	10.00		
	*										
49	KK	OFF20	BASIN								
50	BA	0.008									
51	LG	0.15	0.37	6.54	0.14	0					
52	UC	0.298	0.435								
53	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
54	UA	100									
	*										
55	KK	R10-3	ROUTE								
56	RS	1	FLOW								
57	RC	0.045	0.045	0.045	1000	0.0350	0.00				
58	RX	0.00	20.00	23.00	26.00	30.00	40.00	50.00	60.00		
59	RY	10.20	10.00	10.00	8.00	10.00	10.10	10.20	10.30		
	*										
60	KK	ON10	BASIN								
61	BA	0.011									
62	LG	0.15	0.37	6.54	0.14	0					
63	UC	0.267	0.245								
64	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
65	UA	100									
	*										
66	KK	CP10	COMBINE								
67	HC	4									
	*										
68	KK	ON15	BASIN								
69	BA	0.001									
70	LG	0.15	0.37	6.54	0.14	0					
71	UC	0.138	0.191								
72	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
73	UA	100									
	*										
74	KK	ON20	BASIN								
75	BA	0.001									
76	LG	0.15	0.37	6.54	0.14	0					
77	UC	0.138	0.191								
78	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
79	UA	100									
	*										

1

HEC-1 INPUT

PAGE 3

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

80	KK	ON25	BASIN									
81	BA	0.002										
82	LG	0.15	0.37	6.54	0.14	0						
83	UC	0.174	0.219									
84	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
85	UA	100										
	*											
86	KK	OFF35	BASIN									
87	BA	0.031										
88	LG	0.20	0.31	6.54	0.14	5						
89	UC	0.519	1.084									
90	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
91	UA	100										
	*											
92	KK	R30	ROUTE									
93	RS	1	FLOW									
94	RC	0.045	0.045	0.045	825	0.0250	0.00					
95	RX	0.00	10.00	20.00	23.00	29.00	33.00	40.00	50.00			
96	RY	10.20	10.10	10.00	7.00	7.00	10.00	10.10	10.20			
	*											
97	KK	ON30	BASIN									
98	BA	0.006										
99	LG	0.15	0.37	6.54	0.14	0						
100	UC	0.283	0.389									
101	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
102	UA	100										
	*											
103	KK	CP30	COMBINE									
104	HC	2										
	*											
105	KK	OFF40	BASIN									
106	BA	0.004										
107	LG	0.30	0.19	6.54	0.13	17						
108	UC	0.166	0.258									
109	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
110	UA	100										
	*											
111	KK	R35	ROUTE									
112	RS	1	FLOW									
113	RC	0.045	0.045	0.045	805	0.0220	0.00					
114	RX	0.00	30.00	35.00	38.00	38.50	41.00	45.00	50.00			
115	RY	10.10	10.00	9.90	8.70	9.00	9.90	10.00	10.10			
	*											

1

HEC-1 INPUT

PAGE 4

LINE	ID.....	1.....	2.....	3.....	4.....	5.....	6.....	7.....	8.....	9.....	10	
116	KK	ON35	BASIN									
117	BA	0.003										
118	LG	0.15	0.37	6.54	0.14	0						
119	UC	0.288	0.558									
120	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
121	UA	100										
	*											
122	KK	CP35	COMBINE									
123	HC	2										
	*											
124	KK	OFF50	BASIN									
125	BA	0.001										
126	LG	0.30	0.19	6.54	0.13	17						
127	UC	0.126	0.253									
128	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
129	UA	100										
	*											

130	KK	R40	ROUTE									
131	RS	1	FLOW									
132	RC	0.045	0.045	0.045	780	0.0250	0.00					
133	RX	0.00	30.00	48.00	52.00	58.00	60.00	70.00	80.00			
134	RY	10.10	10.00	9.90	9.20	9.20	9.90	10.00	10.10			
	*											
135	KK	ON40	BASIN									
136	BA	0.006										
137	LG	0.15	0.39	5.85	0.19	0						
138	UC	0.289	0.378									
139	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
140	UA	100										
	*											
141	KK	CP40	COMBINE									
142	HC	2										
	*											
143	KK	OFF30	BASIN									
144	BA	0.036										
145	LG	0.19	0.32	6.54	0.14	4						
146	UC	0.453	0.778									
147	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
148	UA	100										
	*											
149	KK	R045	ROUTE									
150	RS	1	FLOW									
151	RC	0.045	0.045	0.045	1773	0.0300	0.00					
152	RX	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00			
153	RY	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90			
	*											

1

HEC-1 INPUT

PAGE 5

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

154	KK	OFF45	BASIN									
155	BA	0.081										
156	LG	0.26	0.29	5.46	0.21	12						
157	UC	0.442	0.601									
158	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
159	UA	100										
	*											
160	KK	CP045	COMBINE									
161	HC	2										
	*											
162	KK	R45	ROUTE									
163	RS	1	FLOW									
164	RC	0.045	0.045	0.045	395	0.0250	0.00					
165	RX	0.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00			
166	RY	10.10	10.00	9.00	7.50	8.00	8.50	9.00	9.20			
	*											
167	KK	ON45	BASIN									
168	BA	0.001										
169	LG	0.15	0.35	3.29	0.73	0						
170	UC	0.274	0.598									
171	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
172	UA	100										
	*											
173	KK	CP45	COMBINE									
174	HC	2										
	*											
175	ZZ											

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
 LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

```
23      OFF10
      .
30      .-----> DTFF10
29      D0FF10
      V
      V
33      R10-1
      .
38      .      OFF15
      .      V
      .      V
44      .      R10-2
      .
49      .      .      OFF20
      .      .      V
      .      .      V
55      .      .      R10-3
      .
60      .      .      .      ON10
      .
66      CP10.....
      .
68      .      ON15
      .
74      .      .      ON20
      .
80      .      .      .      ON25
      .
86      .      .      .      .      OFF35
      .      .      .      .      V
      .      .      .      .      V
92      .      .      .      .      R30
      .
97      .      .      .      .      .      ON30
      .
103     .      .      .      .      .      CP30.....
      .
105     .      .      .      .      .      OFF40
      .      .      .      .      .      V
      .      .      .      .      .      V
111     .      .      .      .      .      R35
      .
116     .      .      .      .      .      .      ON35
      .
122     .      .      .      .      .      .      CP35.....
      .
124     .      .      .      .      .      .      OFF50
      .      .      .      .      .      .      V
      .      .      .      .      .      .      V
130     .      .      .      .      .      .      R40
      .
135     .      .      .      .      .      .      .      ON40
      .
141     .      .      .      .      .      .      .      CP40.....
      .
143     .      .      .      .      .      .      .      OFF30
```

	.	.	.	.	.	.	.	.	V
	.	.	.	.	.	.	.	.	V
149	.	.	.	.	.	.	.	.	R045
	.	.	.	.	.	.	.	.	.
154	.	.	.	.	.	.	.	.	OFF45
	.	.	.	.	.	.	.	.	.
160	.	.	.	.	.	.	.	.	CP045.....
	.	.	.	.	.	.	.	.	V
	.	.	.	.	.	.	.	.	V
162	.	.	.	.	.	.	.	.	R45
	.	.	.	.	.	.	.	.	.
167	.	.	.	.	.	.	.	.	ON45
	.	.	.	.	.	.	.	.	.
173	.	.	.	.	.	.	.	.	CP45.....

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:49:42
*
*****
    
```

```

*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
```

City of Scottsdale
 SOLITUDE EX - Solitude Existing Conditions Hydrology
 2 YEAR
 6 Hour Storm
 Unit Hydrograph: Clark
 Storm: Multiple
 07/29/2020

```

9 IO      OUTPUT CONTROL VARIABLES
          IPRNT      5 PRINT CONTROL
          IPLOT      0 PLOT CONTROL
          QSCAL      0. HYDROGRAPH PLOT SCALE

IT        HYDROGRAPH TIME DATA
          NMIN       2 MINUTES IN COMPUTATION INTERVAL
          IDATE      1JAN99 STARTING DATE
          ITIME      0000 STARTING TIME
          NQ         2000 NUMBER OF HYDROGRAPH ORDINATES
          NDDATE     3JAN99 ENDING DATE
          NDTIME     1838 ENDING TIME
          ICENT      19 CENTURY MARK

          COMPUTATION INTERVAL .03 HOURS
          TOTAL TIME BASE 66.63 HOURS
    
```

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-Feet
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

```

11 JD      INDEX STORM NO. 1
          STRM      1.34 PRECIPITATION DEPTH
          TRDA      .00 TRANSPOSITION DRAINAGE AREA
    
```

```

12 PI      PRECIPITATION PATTERN
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
    
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

15 JD INDEX STORM NO. 2
 STRM 1.33 PRECIPITATION DEPTH
 TRDA .50 TRANSPOSITION DRAINAGE AREA

16 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

19 JD INDEX STORM NO. 3
 STRM 1.31 PRECIPITATION DEPTH
 TRDA 2.80 TRANSPOSITION DRAINAGE AREA

20 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.02	.02	.02	.02	.02	.02	.02	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

1

RUNOFF SUMMARY
 FLOW IN CUBIC FEET PER SECOND
 TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			
+									
+	HYDROGRAPH AT								
	OFF10	186.	4.57	42.	11.	4.	.90		

+	DIVERSION TO	DTFF10	158.	4.57	36.	9.	3.	.90
+	HYDROGRAPH AT	D0FF10	28.	4.57	6.	2.	1.	.90
+	ROUTED TO	R10-1	27.	4.63	6.	2.	1.	.90
+	HYDROGRAPH AT	OFF15	1.	4.17	0.	0.	0.	.00
+	ROUTED TO	R10-2	1.	4.27	0.	0.	0.	.00
+	HYDROGRAPH AT	OFF20	3.	4.20	0.	0.	0.	.01
+	ROUTED TO	R10-3	3.	4.27	0.	0.	0.	.01
+	HYDROGRAPH AT	ON10	6.	4.17	0.	0.	0.	.01
+	4 COMBINED AT	CP10	30.	4.60	7.	2.	1.	.92
+	HYDROGRAPH AT	ON15	1.	4.07	0.	0.	0.	.00
+	HYDROGRAPH AT	ON20	1.	4.07	0.	0.	0.	.00
+	HYDROGRAPH AT	ON25	1.	4.10	0.	0.	0.	.00
+	HYDROGRAPH AT	OFF35	6.	4.40	1.	0.	0.	.03
+	ROUTED TO	R30	6.	4.47	1.	0.	0.	.03
+	HYDROGRAPH AT	ON30	3.	4.20	0.	0.	0.	.01
+	2 COMBINED AT	CP30	7.	4.43	2.	0.	0.	.04
+	HYDROGRAPH AT	OFF40	3.	4.10	0.	0.	0.	.00
+	ROUTED TO	R35	3.	4.17	0.	0.	0.	.00
+	HYDROGRAPH AT	ON35	1.	4.20	0.	0.	0.	.00
+	2 COMBINED AT	CP35	4.	4.17	0.	0.	0.	.01
+	HYDROGRAPH AT	OFF50	1.	4.07	0.	0.	0.	.00
+	ROUTED TO	R40	1.	4.20	0.	0.	0.	.00
+	HYDROGRAPH AT	ON40	2.	4.20	0.	0.	0.	.01
+	2 COMBINED AT	CP40	3.	4.20	0.	0.	0.	.01
+	HYDROGRAPH AT	OFF30	9.	4.33	2.	0.	0.	.04

+	ROUTED TO	R045	7.	4.60	2.	0.	0.	.04
+	HYDROGRAPH AT	OFF45	25.	4.30	4.	1.	0.	.08
+	2 COMBINED AT	CP045	29.	4.33	5.	1.	1.	.12
+	ROUTED TO	R45	29.	4.37	5.	1.	1.	.12
+	HYDROGRAPH AT	ON45	0.	4.20	0.	0.	0.	.00
+	2 COMBINED AT	CP45	29.	4.37	6.	1.	1.	.12

*** NORMAL END OF HEC-1 ***

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1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:49:59
*
*****
    
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*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
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X X XXXXXX XXXX X
X X X X X XX
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XXXXXX XXXX X XXXX X
X X X X X
X X X X X
X X XXXXXX XXXX XXX
    
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1

HEC-1 INPUT

PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	City of Scottsdale									
2	ID	SOLITUDE EX - Solitude Existing Conditions Hydrology									
3	ID	10 YEAR									
4	ID	6 Hour Storm									
5	ID	Unit Hydrograph: Clark									
6	ID	Storm: Multiple									
7	ID	07/29/2020									
	*DIAGRAM										
8	IT	2	1JAN99	0	2000						
9	IO	5									
10	IN	15									
	*										
11	JD	1.995	0.0001								
12	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
13	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
14	PC	0.962	0.972	0.983	0.991	1.000					
15	JD	1.983	0.5000								
16	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
17	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
18	PC	0.962	0.972	0.983	0.991	1.000					
19	JD	1.945	2.8								
20	PC	0.000	0.009	0.016	0.025	0.034	0.042	0.051	0.059	0.067	0.076
21	PC	0.087	0.100	0.120	0.163	0.252	0.451	0.694	0.837	0.900	0.938
22	PC	0.950	0.963	0.975	0.988	1.000					
	*										
23	KK	OFF10	BASIN								
24	BA	0.900									
25	LG	0.30	0.28	5.58	0.23	21					
26	UC	0.671	0.642								
27	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
28	UA	100									
	*										
29	KK	DOFF10	DIVERT								
30	DT	DTFF10	0.0	0.0							
31	DI	0.0	100.0	200.0	500.0	1000.0	2000.0	4000.0	10000.0	20000.0	50000.0

32	DQ	0.0	85.0	170.0	425.0	850.0	1700.0	3400.0	8500.0	17000.0	42500.0
	*										
33	KK	R10-1	ROUTE								
34	RS	1	FLOW								
35	RC	0.045	0.045	0.045	800	0.0275	0.00				
36	RX	0.00	30.00	60.00	65.00	90.00	95.00	110.00	130.00		
37	RY	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20		
	*										
38	KK	OFF15	BASIN								
39	BA	0.003									
40	LG	0.15	0.37	6.54	0.14	0					
41	UC	0.209	0.327								
42	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
43	UA	100									
	*										

1

HEC-1 INPUT

PAGE 2

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

44	KK	R10-2	ROUTE								
45	RS	1	FLOW								
46	RC	0.045	0.045	0.045	930	0.0300	0.00				
47	RX	0.00	10.00	38.00	40.00	42.00	50.00	60.00	70.00		
48	RY	10.00	9.90	9.80	9.00	9.80	9.90	10.00	10.00		
	*										
49	KK	OFF20	BASIN								
50	BA	0.008									
51	LG	0.15	0.37	6.54	0.14	0					
52	UC	0.261	0.375								
53	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
54	UA	100									
	*										
55	KK	R10-3	ROUTE								
56	RS	1	FLOW								
57	RC	0.045	0.045	0.045	1000	0.0350	0.00				
58	RX	0.00	20.00	23.00	26.00	30.00	40.00	50.00	60.00		
59	RY	10.20	10.00	10.00	8.00	10.00	10.10	10.20	10.30		
	*										
60	KK	ON10	BASIN								
61	BA	0.011									
62	LG	0.15	0.37	6.54	0.14	0					
63	UC	0.234	0.211								
64	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
65	UA	100									
	*										
66	KK	CP10	COMBINE								
67	HC	4									
	*										
68	KK	ON15	BASIN								
69	BA	0.001									
70	LG	0.15	0.37	6.54	0.14	0					
71	UC	0.120	0.165								
72	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
73	UA	100									
	*										
74	KK	ON20	BASIN								
75	BA	0.001									
76	LG	0.15	0.37	6.54	0.14	0					
77	UC	0.120	0.165								
78	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
79	UA	100									
	*										

1

HEC-1 INPUT

PAGE 3

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

80	KK	ON25	BASIN									
81	BA	0.002										
82	LG	0.15	0.37	6.54	0.14	0						
83	UC	0.152	0.189									
84	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
85	UA	100										
	*											
86	KK	OFF35	BASIN									
87	BA	0.031										
88	LG	0.20	0.31	6.54	0.14	5						
89	UC	0.456	0.937									
90	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
91	UA	100										
	*											
92	KK	R30	ROUTE									
93	RS	1	FLOW									
94	RC	0.045	0.045	0.045	825	0.0250	0.00					
95	RX	0.00	10.00	20.00	23.00	29.00	33.00	40.00	50.00			
96	RY	10.20	10.10	10.00	7.00	7.00	10.00	10.10	10.20			
	*											
97	KK	ON30	BASIN									
98	BA	0.006										
99	LG	0.15	0.37	6.54	0.14	0						
100	UC	0.248	0.335									
101	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
102	UA	100										
	*											
103	KK	CP30	COMBINE									
104	HC	2										
	*											
105	KK	OFF40	BASIN									
106	BA	0.004										
107	LG	0.30	0.19	6.54	0.13	17						
108	UC	0.147	0.226									
109	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
110	UA	100										
	*											
111	KK	R35	ROUTE									
112	RS	1	FLOW									
113	RC	0.045	0.045	0.045	805	0.0220	0.00					
114	RX	0.00	30.00	35.00	38.00	38.50	41.00	45.00	50.00			
115	RY	10.10	10.00	9.90	8.70	9.00	9.90	10.00	10.10			
	*											

1

HEC-1 INPUT

PAGE 4

LINE	ID.....	1.....	2.....	3.....	4.....	5.....	6.....	7.....	8.....	9.....	10	
116	KK	ON35	BASIN									
117	BA	0.003										
118	LG	0.15	0.37	6.54	0.14	0						
119	UC	0.252	0.481									
120	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
121	UA	100										
	*											
122	KK	CP35	COMBINE									
123	HC	2										
	*											
124	KK	OFF50	BASIN									
125	BA	0.001										
126	LG	0.30	0.19	6.54	0.13	17						
127	UC	0.112	0.222									
128	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
129	UA	100										
	*											

130	KK	R40	ROUTE									
131	RS	1	FLOW									
132	RC	0.045	0.045	0.045	780	0.0250	0.00					
133	RX	0.00	30.00	48.00	52.00	58.00	60.00	70.00	80.00			
134	RY	10.10	10.00	9.90	9.20	9.20	9.90	10.00	10.10			
	*											
135	KK	ON40	BASIN									
136	BA	0.006										
137	LG	0.15	0.39	5.85	0.19	0						
138	UC	0.253	0.326									
139	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
140	UA	100										
	*											
141	KK	CP40	COMBINE									
142	HC	2										
	*											
143	KK	OFF30	BASIN									
144	BA	0.036										
145	LG	0.19	0.32	6.54	0.14	4						
146	UC	0.398	0.672									
147	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
148	UA	100										
	*											
149	KK	R045	ROUTE									
150	RS	1	FLOW									
151	RC	0.045	0.045	0.045	1773	0.0300	0.00					
152	RX	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00			
153	RY	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90			
	*											

1

HEC-1 INPUT

PAGE 5

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

154	KK	OFF45	BASIN									
155	BA	0.081										
156	LG	0.26	0.29	5.46	0.21	12						
157	UC	0.392	0.526									
158	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
159	UA	100										
	*											
160	KK	CP045	COMBINE									
161	HC	2										
	*											
162	KK	R45	ROUTE									
163	RS	1	FLOW									
164	RC	0.045	0.045	0.045	395	0.0250	0.00					
165	RX	0.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00			
166	RY	10.10	10.00	9.00	7.50	8.00	8.50	9.00	9.20			
	*											
167	KK	ON45	BASIN									
168	BA	0.001										
169	LG	0.15	0.35	3.29	0.73	0						
170	UC	0.222	0.474									
171	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
172	UA	100										
	*											
173	KK	CP45	COMBINE									
174	HC	2										
	*											
175	ZZ											

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

```
23      OFF10
      .
30      .-----> DTFF10
29      D0FF10
      V
      V
33      R10-1
      .
38      .      OFF15
      .      V
      .      V
44      .      R10-2
      .
49      .      .      OFF20
      .      .      V
      .      .      V
55      .      .      R10-3
      .
60      .      .      .      ON10
      .
66      CP10.....
      .
68      .      ON15
      .
74      .      .      ON20
      .
80      .      .      .      ON25
      .
86      .      .      .      .      OFF35
      .      .      .      .      V
      .      .      .      .      V
92      .      .      .      .      R30
      .
97      .      .      .      .      .      ON30
      .
103     .      .      .      .      .      CP30.....
      .
105     .      .      .      .      .      OFF40
      .      .      .      .      .      V
      .      .      .      .      .      V
111     .      .      .      .      .      R35
      .
116     .      .      .      .      .      .      ON35
      .
122     .      .      .      .      .      .      CP35.....
      .
124     .      .      .      .      .      .      OFF50
      .      .      .      .      .      .      V
      .      .      .      .      .      .      V
130     .      .      .      .      .      .      R40
      .
135     .      .      .      .      .      .      .      ON40
      .
141     .      .      .      .      .      .      .      CP40.....
      .
143     .      .      .      .      .      .      .      OFF30
```

	.	.	.	.	.	.	.	.	V
	.	.	.	.	.	.	.	.	V
149	.	.	.	.	.	.	.	.	R045
	.	.	.	.	.	.	.	.	.
154	.	.	.	.	.	.	.	.	OFF45
	.	.	.	.	.	.	.	.	.
160	.	.	.	.	.	.	.	.	CP045.....
	.	.	.	.	.	.	.	.	V
	.	.	.	.	.	.	.	.	V
162	.	.	.	.	.	.	.	.	R45
	.	.	.	.	.	.	.	.	.
167	.	.	.	.	.	.	.	.	ON45
	.	.	.	.	.	.	.	.	.
173	.	.	.	.	.	.	.	.	CP45.....

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:49:59
*
*****
    
```

```

*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
```

City of Scottsdale
 SOLITUDE EX - Solitude Existing Conditions Hydrology
 10 YEAR
 6 Hour Storm
 Unit Hydrograph: Clark
 Storm: Multiple
 07/29/2020

```

9 IO      OUTPUT CONTROL VARIABLES
          IPRNT      5 PRINT CONTROL
          IPLOT      0 PLOT CONTROL
          QSCAL      0. HYDROGRAPH PLOT SCALE

IT        HYDROGRAPH TIME DATA
          NMIN       2 MINUTES IN COMPUTATION INTERVAL
          IDATE      1JAN99 STARTING DATE
          ITIME      0000 STARTING TIME
          NQ         2000 NUMBER OF HYDROGRAPH ORDINATES
          NDDATE     3JAN99 ENDING DATE
          NDTIME     1838 ENDING TIME
          ICENT      19 CENTURY MARK

          COMPUTATION INTERVAL .03 HOURS
          TOTAL TIME BASE 66.63 HOURS
    
```

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-Feet
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

```

11 JD      INDEX STORM NO. 1
          STRM      2.00 PRECIPITATION DEPTH
          TRDA      .00 TRANSPOSITION DRAINAGE AREA
    
```

```

12 PI      PRECIPITATION PATTERN
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
    
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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15 JD INDEX STORM NO. 2
 STRM 1.98 PRECIPITATION DEPTH
 TRDA .50 TRANSPOSITION DRAINAGE AREA

16 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

19 JD INDEX STORM NO. 3
 STRM 1.95 PRECIPITATION DEPTH
 TRDA 2.80 TRANSPOSITION DRAINAGE AREA

20 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.02	.02	.02	.02	.02	.02	.02	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

1

RUNOFF SUMMARY
 FLOW IN CUBIC FEET PER SECOND
 TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			
+									
+	HYDROGRAPH AT								
	OFF10	439.	4.47	85.	22.	8.	.90		

+	DIVERSION TO	DTFF10	374.	4.47	72.	18.	7.	.90
+	HYDROGRAPH AT	D0FF10	66.	4.47	13.	3.	1.	.90
+	ROUTED TO	R10-1	65.	4.53	13.	3.	1.	.90
+	HYDROGRAPH AT	OFF15	3.	4.13	0.	0.	0.	.00
+	ROUTED TO	R10-2	3.	4.20	0.	0.	0.	.00
+	HYDROGRAPH AT	OFF20	7.	4.17	1.	0.	0.	.01
+	ROUTED TO	R10-3	7.	4.23	1.	0.	0.	.01
+	HYDROGRAPH AT	ON10	14.	4.13	1.	0.	0.	.01
+	4 COMBINED AT	CP10	72.	4.50	14.	4.	1.	.92
+	HYDROGRAPH AT	ON15	1.	4.07	0.	0.	0.	.00
+	HYDROGRAPH AT	ON20	1.	4.07	0.	0.	0.	.00
+	HYDROGRAPH AT	ON25	3.	4.07	0.	0.	0.	.00
+	HYDROGRAPH AT	OFF35	14.	4.33	3.	1.	0.	.03
+	ROUTED TO	R30	14.	4.40	3.	1.	0.	.03
+	HYDROGRAPH AT	ON30	6.	4.17	1.	0.	0.	.01
+	2 COMBINED AT	CP30	17.	4.37	3.	1.	0.	.04
+	HYDROGRAPH AT	OFF40	6.	4.07	0.	0.	0.	.00
+	ROUTED TO	R35	5.	4.13	0.	0.	0.	.00
+	HYDROGRAPH AT	ON35	2.	4.17	0.	0.	0.	.00
+	2 COMBINED AT	CP35	7.	4.13	1.	0.	0.	.01
+	HYDROGRAPH AT	OFF50	1.	4.07	0.	0.	0.	.00
+	ROUTED TO	R40	1.	4.13	0.	0.	0.	.00
+	HYDROGRAPH AT	ON40	5.	4.17	0.	0.	0.	.01
+	2 COMBINED AT	CP40	6.	4.17	1.	0.	0.	.01
+	HYDROGRAPH AT	OFF30	21.	4.27	3.	1.	0.	.04

+	ROUTED TO	R045	17.	4.50	3.	1.	0.	.04
+	HYDROGRAPH AT	OFF45	55.	4.27	8.	2.	1.	.08
+	2 COMBINED AT	CP045	67.	4.30	11.	3.	1.	.12
+	ROUTED TO	R45	66.	4.30	11.	3.	1.	.12
+	HYDROGRAPH AT	ON45	0.	4.17	0.	0.	0.	.00
+	2 COMBINED AT	CP45	67.	4.30	11.	3.	1.	.12

*** NORMAL END OF HEC-1 ***

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1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:50:17
*
*****
    
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*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
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      X   X  XXXXXX  XXXXX      X
      X   X  X      X   X      XX
      X   X  X      X           X
      XXXXXX XXXX  X      XXXXX  X
      X   X  X      X           X
      X   X  X      X   X      X
      X   X  XXXXXX  XXXXX      XXX
    
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1

HEC-1 INPUT

PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	City of Scottsdale									
2	ID	SOLITUDE EX - Solitude Existing Conditions Hydrology									
3	ID	100 YEAR									
4	ID	6 Hour Storm									
5	ID	Unit Hydrograph: Clark									
6	ID	Storm: Multiple									
7	ID	07/29/2020									
	*DIAGRAM										
8	IT	2	1JAN99	0	2000						
9	IO	5									
10	IN	15									
	*										
11	JD	3.024	0.0001								
12	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
13	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
14	PC	0.962	0.972	0.983	0.991	1.000					
15	JD	3.006	0.5000								
16	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
17	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
18	PC	0.962	0.972	0.983	0.991	1.000					
19	JD	2.948	2.8								
20	PC	0.000	0.009	0.016	0.025	0.034	0.042	0.051	0.059	0.067	0.076
21	PC	0.087	0.100	0.120	0.163	0.252	0.451	0.694	0.837	0.900	0.938
22	PC	0.950	0.963	0.975	0.988	1.000					
	*										
23	KK	OFF10	BASIN								
24	BA	0.900									
25	LG	0.30	0.28	5.58	0.23	21					
26	UC	0.515	0.478								
27	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
28	UA	100									
	*										
29	KK	DOFF10	DIVERT								
30	DT	DTFF10	0.0	0.0							
31	DI	0.0	100.0	200.0	500.0	1000.0	2000.0	4000.0	10000.0	20000.0	50000.0

32	DQ	0.0	85.0	170.0	425.0	850.0	1700.0	3400.0	8500.0	17000.0	42500.0
	*										
33	KK	R10-1	ROUTE								
34	RS	1	FLOW								
35	RC	0.045	0.045	0.045	800	0.0275	0.00				
36	RX	0.00	30.00	60.00	65.00	90.00	95.00	110.00	130.00		
37	RY	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20		
	*										
38	KK	OFF15	BASIN								
39	BA	0.003									
40	LG	0.15	0.37	6.54	0.14	0					
41	UC	0.161	0.244								
42	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
43	UA	100									
	*										

1

HEC-1 INPUT

PAGE 2

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

44	KK	R10-2	ROUTE								
45	RS	1	FLOW								
46	RC	0.045	0.045	0.045	930	0.0300	0.00				
47	RX	0.00	10.00	38.00	40.00	42.00	50.00	60.00	70.00		
48	RY	10.00	9.90	9.80	9.00	9.80	9.90	10.00	10.00		
	*										
49	KK	OFF20	BASIN								
50	BA	0.008									
51	LG	0.15	0.37	6.54	0.14	0					
52	UC	0.201	0.281								
53	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
54	UA	100									
	*										
55	KK	R10-3	ROUTE								
56	RS	1	FLOW								
57	RC	0.045	0.045	0.045	1000	0.0350	0.00				
58	RX	0.00	20.00	23.00	26.00	30.00	40.00	50.00	60.00		
59	RY	10.20	10.00	10.00	8.00	10.00	10.10	10.20	10.30		
	*										
60	KK	ON10	BASIN								
61	BA	0.011									
62	LG	0.15	0.37	6.54	0.14	0					
63	UC	0.180	0.158								
64	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
65	UA	100									
	*										
66	KK	CP10	COMBINE								
67	HC	4									
	*										
68	KK	ON15	BASIN								
69	BA	0.001									
70	LG	0.15	0.37	6.54	0.14	0					
71	UC	0.093	0.123								
72	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
73	UA	100									
	*										
74	KK	ON20	BASIN								
75	BA	0.001									
76	LG	0.15	0.37	6.54	0.14	0					
77	UC	0.093	0.123								
78	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
79	UA	100									
	*										

1

HEC-1 INPUT

PAGE 3

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

80	KK	ON25	BASIN									
81	BA	0.002										
82	LG	0.15	0.37	6.54	0.14	0						
83	UC	0.117	0.141									
84	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
85	UA	100										
	*											
86	KK	OFF35	BASIN									
87	BA	0.031										
88	LG	0.20	0.31	6.54	0.14	5						
89	UC	0.355	0.711									
90	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
91	UA	100										
	*											
92	KK	R30	ROUTE									
93	RS	1	FLOW									
94	RC	0.045	0.045	0.045	825	0.0250	0.00					
95	RX	0.00	10.00	20.00	23.00	29.00	33.00	40.00	50.00			
96	RY	10.20	10.10	10.00	7.00	7.00	10.00	10.10	10.20			
	*											
97	KK	ON30	BASIN									
98	BA	0.006										
99	LG	0.15	0.37	6.54	0.14	0						
100	UC	0.191	0.251									
101	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
102	UA	100										
	*											
103	KK	CP30	COMBINE									
104	HC	2										
	*											
105	KK	OFF40	BASIN									
106	BA	0.004										
107	LG	0.30	0.19	6.54	0.13	17						
108	UC	0.118	0.176									
109	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
110	UA	100										
	*											
111	KK	R35	ROUTE									
112	RS	1	FLOW									
113	RC	0.045	0.045	0.045	805	0.0220	0.00					
114	RX	0.00	30.00	35.00	38.00	38.50	41.00	45.00	50.00			
115	RY	10.10	10.00	9.90	8.70	9.00	9.90	10.00	10.10			
	*											

1

HEC-1 INPUT

PAGE 4

LINE	ID.....	1.....	2.....	3.....	4.....	5.....	6.....	7.....	8.....	9.....	10	
116	KK	ON35	BASIN									
117	BA	0.003										
118	LG	0.15	0.37	6.54	0.14	0						
119	UC	0.194	0.360									
120	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
121	UA	100										
	*											
122	KK	CP35	COMBINE									
123	HC	2										
	*											
124	KK	OFF50	BASIN									
125	BA	0.001										
126	LG	0.30	0.19	6.54	0.13	17						
127	UC	0.090	0.173									
128	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
129	UA	100										
	*											

130	KK	R40	ROUTE									
131	RS	1	FLOW									
132	RC	0.045	0.045	0.045	780	0.0250	0.00					
133	RX	0.00	30.00	48.00	52.00	58.00	60.00	70.00	80.00			
134	RY	10.10	10.00	9.90	9.20	9.20	9.90	10.00	10.10			
	*											
135	KK	ON40	BASIN									
136	BA	0.006										
137	LG	0.15	0.39	5.85	0.19	0						
138	UC	0.192	0.240									
139	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
140	UA	100										
	*											
141	KK	CP40	COMBINE									
142	HC	2										
	*											
143	KK	OFF30	BASIN									
144	BA	0.036										
145	LG	0.19	0.32	6.54	0.14	4						
146	UC	0.309	0.509									
147	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
148	UA	100										
	*											
149	KK	R045	ROUTE									
150	RS	1	FLOW									
151	RC	0.045	0.045	0.045	1773	0.0300	0.00					
152	RX	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00			
153	RY	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90			
	*											

1

HEC-1 INPUT

PAGE 5

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

154	KK	OFF45	BASIN									
155	BA	0.081										
156	LG	0.26	0.29	5.46	0.21	12						
157	UC	0.303	0.396									
158	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
159	UA	100										
	*											
160	KK	CP045	COMBINE									
161	HC	2										
	*											
162	KK	R45	ROUTE									
163	RS	1	FLOW									
164	RC	0.045	0.045	0.045	395	0.0250	0.00					
165	RX	0.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00			
166	RY	10.10	10.00	9.00	7.50	8.00	8.50	9.00	9.20			
	*											
167	KK	ON45	BASIN									
168	BA	0.001										
169	LG	0.15	0.35	3.29	0.73	0						
170	UC	0.164	0.339									
171	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
172	UA	100										
	*											
173	KK	CP45	COMBINE									
174	HC	2										
	*											
175	ZZ											

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

```
23      OFF10
      .
30      .-----> DTFF10
29      D0FF10
      V
      V
33      R10-1
      .
38      .      OFF15
      .      V
      .      V
44      .      R10-2
      .
49      .      .      OFF20
      .      .      V
      .      .      V
55      .      .      R10-3
      .
60      .      .      .      ON10
      .
66      CP10.....
      .
68      .      ON15
      .
74      .      .      ON20
      .
80      .      .      .      ON25
      .
86      .      .      .      .      OFF35
      .      .      .      .      V
      .      .      .      .      V
92      .      .      .      .      R30
      .
97      .      .      .      .      .      ON30
      .
103     .      .      .      .      .      CP30.....
      .
105     .      .      .      .      .      OFF40
      .      .      .      .      .      V
      .      .      .      .      .      V
111     .      .      .      .      .      R35
      .
116     .      .      .      .      .      .      ON35
      .
122     .      .      .      .      .      .      CP35.....
      .
124     .      .      .      .      .      .      OFF50
      .      .      .      .      .      .      V
      .      .      .      .      .      .      V
130     .      .      .      .      .      .      R40
      .
135     .      .      .      .      .      .      .      ON40
      .
141     .      .      .      .      .      .      .      CP40.....
      .
143     .      .      .      .      .      .      .      OFF30
```

	.	.	.	.	.	.	.	.	V
	.	.	.	.	.	.	.	.	V
149	.	.	.	.	.	.	.	.	R045
	.	.	.	.	.	.	.	.	.
154	.	.	.	.	.	.	.	.	OFF45
	.	.	.	.	.	.	.	.	.
160	.	.	.	.	.	.	.	.	CP045.....
	.	.	.	.	.	.	.	.	V
	.	.	.	.	.	.	.	.	V
162	.	.	.	.	.	.	.	.	R45
	.	.	.	.	.	.	.	.	.
167	.	.	.	.	.	.	.	.	ON45
	.	.	.	.	.	.	.	.	.
173	.	.	.	.	.	.	.	.	CP45.....

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:50:17
*
*****
    
```

```

*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
```

City of Scottsdale
 SOLITUDE EX - Solitude Existing Conditions Hydrology
 100 YEAR
 6 Hour Storm
 Unit Hydrograph: Clark
 Storm: Multiple
 07/29/2020

```

9 IO      OUTPUT CONTROL VARIABLES
          IPRNT      5 PRINT CONTROL
          IPLOT      0 PLOT CONTROL
          QSCAL      0. HYDROGRAPH PLOT SCALE

IT        HYDROGRAPH TIME DATA
          NMIN       2 MINUTES IN COMPUTATION INTERVAL
          IDATE      1JAN99 STARTING DATE
          ITIME      0000 STARTING TIME
          NQ         2000 NUMBER OF HYDROGRAPH ORDINATES
          NDDATE     3JAN99 ENDING DATE
          NDTIME     1838 ENDING TIME
          ICENT      19 CENTURY MARK

          COMPUTATION INTERVAL .03 HOURS
          TOTAL TIME BASE 66.63 HOURS
    
```

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-Feet
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

```

11 JD      INDEX STORM NO. 1
          STRM      3.02 PRECIPITATION DEPTH
          TRDA      .00 TRANSPOSITION DRAINAGE AREA
    
```

```

12 PI      PRECIPITATION PATTERN
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
    
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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15 JD INDEX STORM NO. 2
 STRM 3.01 PRECIPITATION DEPTH
 TRDA .50 TRANSPOSITION DRAINAGE AREA

16 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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19 JD INDEX STORM NO. 3
 STRM 2.95 PRECIPITATION DEPTH
 TRDA 2.80 TRANSPOSITION DRAINAGE AREA

20 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.02	.02	.02	.02	.02	.02	.02	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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1

RUNOFF SUMMARY
 FLOW IN CUBIC FEET PER SECOND
 TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			
+									
+	HYDROGRAPH AT								
	OFF10	1028.	4.33	166.	42.	15.	.90		

+	DIVERSION TO	DTFF10	874.	4.33	141.	35.	13.	.90
+	HYDROGRAPH AT	D0FF10	154.	4.33	25.	6.	2.	.90
+	ROUTED TO	R10-1	152.	4.40	25.	6.	2.	.90
+	HYDROGRAPH AT	OFF15	6.	4.10	1.	0.	0.	.00
+	ROUTED TO	R10-2	4.	4.40	1.	0.	0.	.00
+	HYDROGRAPH AT	OFF20	15.	4.13	1.	0.	0.	.01
+	ROUTED TO	R10-3	15.	4.17	1.	0.	0.	.01
+	HYDROGRAPH AT	ON10	27.	4.10	2.	0.	0.	.01
+	4 COMBINED AT	CP10	172.	4.37	28.	7.	3.	.92
+	HYDROGRAPH AT	ON15	3.	4.03	0.	0.	0.	.00
+	HYDROGRAPH AT	ON20	3.	4.03	0.	0.	0.	.00
+	HYDROGRAPH AT	ON25	5.	4.03	0.	0.	0.	.00
+	HYDROGRAPH AT	OFF35	33.	4.27	6.	1.	1.	.03
+	ROUTED TO	R30	32.	4.30	6.	1.	1.	.03
+	HYDROGRAPH AT	ON30	12.	4.10	1.	0.	0.	.01
+	2 COMBINED AT	CP30	40.	4.27	7.	2.	1.	.04
+	HYDROGRAPH AT	OFF40	10.	4.07	1.	0.	0.	.00
+	ROUTED TO	R35	10.	4.10	1.	0.	0.	.00
+	HYDROGRAPH AT	ON35	5.	4.13	1.	0.	0.	.00
+	2 COMBINED AT	CP35	15.	4.10	1.	0.	0.	.01
+	HYDROGRAPH AT	OFF50	3.	4.03	0.	0.	0.	.00
+	ROUTED TO	R40	2.	4.10	0.	0.	0.	.00
+	HYDROGRAPH AT	ON40	12.	4.10	1.	0.	0.	.01
+	2 COMBINED AT	CP40	14.	4.10	1.	0.	0.	.01
+	HYDROGRAPH AT	OFF30	48.	4.20	7.	2.	1.	.04

+	ROUTED TO	R045	39.	4.37	7.	2.	1.	.04
+	HYDROGRAPH AT	OFF45	124.	4.20	15.	4.	1.	.08
+	2 COMBINED AT	CP045	154.	4.20	21.	5.	2.	.12
+	ROUTED TO	R45	154.	4.23	21.	5.	2.	.12
+	HYDROGRAPH AT	ON45	1.	4.10	0.	0.	0.	.00
+	2 COMBINED AT	CP45	155.	4.23	22.	5.	2.	.12

*** NORMAL END OF HEC-1 ***

Proposed Condition

City of Scottsdale
Drainage Design Management System
SUB BASINS

Page 1

Project Reference: SOLITUDE PROP

7/29/2020

Area ID	Sub Basin Parameters						Rainfall Losses					Return Period Parameters						
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
OFF10	0.900	3.21	245.5	237.0	Natural	0.034	0.30	0.28	5.58	0.231	21	Tc (Hrs)	0.766*	0.749*	0.671*	0.594*	0.550*	0.515 *
												Vel (f/s)	6.15	6.29	7.02	7.93	8.56	9.14
												R (Hrs)	0.743	0.724	0.642	0.560	0.514	0.478
OFF15	0.003	0.12	176.5	176.5	Natural	0.076	0.15	0.37	6.54	0.140		Tc (Hrs)	0.238	0.233	0.209	0.185	0.171	0.161
												Vel (f/s)	0.74	0.76	0.84	0.95	1.03	1.09
												R (Hrs)	0.379	0.369	0.327	0.285	0.262	0.244
OFF20	0.008	0.21	184.0	184.0	Natural	0.070	0.15	0.37	6.54	0.140		Tc (Hrs)	0.298	0.291	0.261	0.231	0.214	0.201
												Vel (f/s)	1.03	1.06	1.18	1.33	1.44	1.53
												R (Hrs)	0.435	0.423	0.375	0.327	0.301	0.281
OFF30	0.036	0.71	204.2	204.0	Natural	0.054	0.19	0.32	6.54	0.138	4	Tc (Hrs)	0.453*	0.443*	0.398	0.354	0.329	0.309
												Vel (f/s)	2.30	2.35	2.62	2.94	3.17	3.37
												R (Hrs)	0.778	0.758	0.672	0.590	0.545	0.509
OFF35	0.031	0.80	147.5	147.5	Natural	0.052	0.20	0.31	6.54	0.138	5	Tc (Hrs)	0.519*	0.508*	0.456*	0.406	0.378	0.355
												Vel (f/s)	2.26	2.31	2.57	2.89	3.10	3.31
												R (Hrs)	1.084	1.056	0.937	0.824	0.761	0.711
OFF40	0.004	0.15	179.3	179.3	Natural	0.037	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.166	0.163	0.147	0.133	0.125	0.118
												Vel (f/s)	1.33	1.35	1.50	1.65	1.76	1.86
												R (Hrs)	0.258	0.251	0.226	0.201	0.187	0.176
OFF45	0.081	0.95	194.1	194.1	Natural	0.037	0.26	0.29	5.46	0.212	12	Tc (Hrs)	0.442*	0.432*	0.392	0.349	0.324	0.303
												Vel (f/s)	3.15	3.23	3.55	3.99	4.30	4.60
												R (Hrs)	0.601	0.586	0.526	0.463	0.425	0.396
OFF50	0.001	0.08	187.5	187.5	Natural	0.041	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.126	0.124	0.112	0.101	0.095*	0.090 *
												Vel (f/s)	0.93	0.95	1.05	1.16	1.24	1.30
												R (Hrs)	0.253	0.247	0.222	0.198	0.184	0.173
ON10	0.003	0.15	145.7	145.7	Natural	0.076	0.15	0.37	6.54	0.140		Tc (Hrs)	0.283	0.276	0.248	0.219	0.203	0.191
												Vel (f/s)	0.78	0.80	0.89	1.00	1.08	1.15
												R (Hrs)	0.548	0.533	0.472	0.412	0.379	0.353

* Non default value or value out of range

(stSubBasCG.rpt)

17-ZN-2019
8/5/2020

City of Scottsdale
Drainage Design Management System
SUB BASINS

Project Reference: SOLITUDE PROP

Page 2

7/29/2020

Area ID	Sub Basin Parameters						Rainfall Losses					Return Period Parameters						
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
ON11	0.004	0.11	87.7	87.7	NATURAL	0.037	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.178	0.174	0.158	0.142	0.133	0.126
												Vel (f/s)	0.91	0.93	1.02	1.14	1.21	1.28
												R (Hrs)	0.217	0.211	0.189	0.169	0.157	0.148
ON15	0.001	0.07	76.9	76.9	Natural	0.041	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.156	0.152	0.138	0.125	0.117	0.110
												Vel (f/s)	0.66	0.68	0.74	0.82	0.88	0.93
												R (Hrs)	0.287	0.280	0.251	0.224	0.209	0.196
ON20	0.001	0.08	66.7	66.7	Natural	0.041	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.174	0.170	0.154	0.139	0.131	0.123
												Vel (f/s)	0.67	0.69	0.76	0.84	0.90	0.95
												R (Hrs)	0.362	0.352	0.316	0.282	0.263	0.247
ON25	0.001	0.07	121.2	121.2	NATURAL	0.041	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.135	0.132	0.120	0.108	0.102	0.096 *
												Vel (f/s)	0.76	0.78	0.86	0.95	1.01	1.07
												R (Hrs)	0.246	0.239	0.215	0.192	0.178	0.168
ON26	0.008	0.18	44.4	44.4	NATURAL	0.036	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.277	0.271	0.246	0.222	0.208	0.196
												Vel (f/s)	0.95	0.97	1.07	1.19	1.27	1.35
												R (Hrs)	0.354	0.345	0.309	0.276	0.257	0.241
ON27	0.001	0.08	177.2	177.2	NATURAL	0.083	0.15	0.37	6.54	0.140		Tc (Hrs)	0.204	0.199	0.178	0.158	0.146	0.137
												Vel (f/s)	0.58	0.59	0.66	0.74	0.80	0.86
												R (Hrs)	0.430	0.419	0.371	0.323	0.298	0.277
ON28	0.001	0.10	168.4	168.4	NATURAL	0.083	0.15	0.37	6.54	0.140		Tc (Hrs)	0.231	0.226	0.202	0.179	0.166	0.156
												Vel (f/s)	0.63	0.65	0.73	0.82	0.88	0.94
												R (Hrs)	0.592	0.576	0.511	0.445	0.410	0.382
ON30	0.002	0.10	40.4	40.4	Natural	0.039	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.222	0.217	0.196	0.177	0.166	0.157
												Vel (f/s)	0.66	0.68	0.75	0.83	0.88	0.93
												R (Hrs)	0.380	0.371	0.333	0.297	0.276	0.260
ON35	0.003	0.08	105.3	105.3	Natural	0.038	0.30	0.19	6.54	0.133	17	Tc (Hrs)	0.145	0.142	0.129	0.116	0.109	0.103
												Vel (f/s)	0.81	0.83	0.91	1.01	1.08	1.14
												R (Hrs)	0.158	0.154	0.138	0.123	0.115	0.108

* Non default value or value out of range

(stSubBasCG.rpt)

17-ZN-2019
8/5/2020

City of Scottsdale
Drainage Design Management System
SUB BASINS

Project Reference: SOLITUDE PROP

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7/29/2020

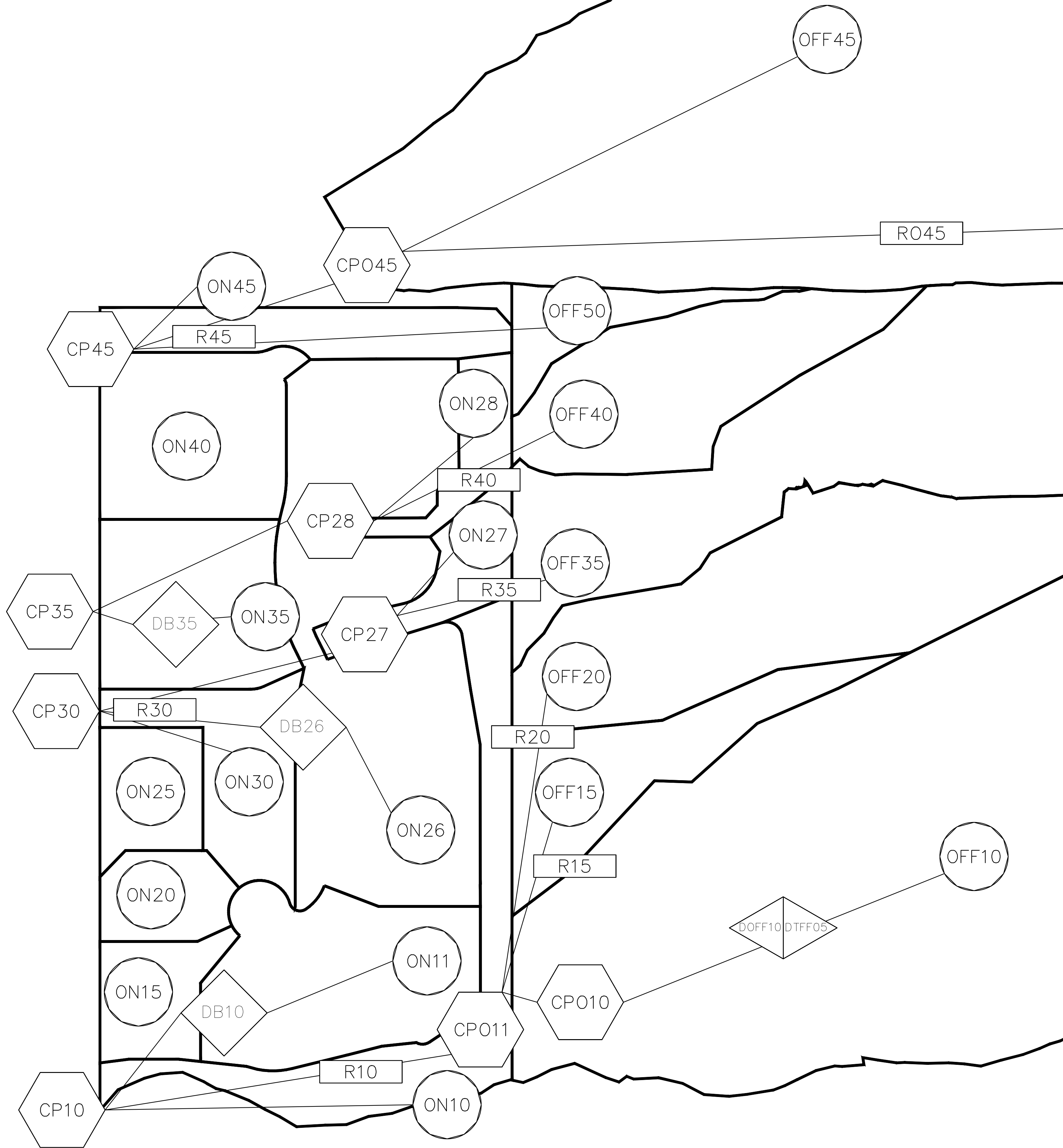
Area ID	Sub Basin Parameters						Rainfall Losses					Return Period Parameters						
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
ON40	0.003	0.10	84.2	84.2	NATURAL	0.038	0.30	0.25	4.72	0.303	17	Tc (Hrs)	0.189	0.184	0.168	0.151	0.140	0.131
												Vel (f/s)	0.78	0.80	0.87	0.97	1.05	1.12
												R (Hrs)	0.252	0.246	0.221	0.197	0.181	0.168
ON45	0.001	0.12	146.3	146.3	NATURAL	0.083	0.15	0.35	4.72	0.319		Tc (Hrs)	0.290	0.282	0.252	0.223	0.205	0.190
												Vel (f/s)	0.61	0.62	0.70	0.79	0.86	0.93
												R (Hrs)	0.879	0.853	0.753	0.659	0.600	0.552

* Non default value or value out of range

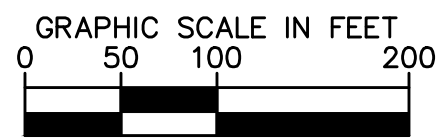
(stSubBasCG.rpt)

17-ZN-2019
8/5/2020

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OFF-SITE
SEE EXISTING
CONDITION
HEC-1 MAP



PROJECT NO. 291203001		NO.		REVISION		BY DATE APPR.	
DRAWING NAME		1		OF		1	
SOLITUDE PROPOSED CONDITION HEC-1 MAP SCOTTSDALE, ARIZONA		SCALE (H): 1"=100' SCALE (V): NONE		DESIGNED BY: ZJH DRAWN BY: ZJH CHECKED BY: JMB		DATE: SEP 2019	
KIMLEY»Horn		© 2019 KIMLEY-HORN AND ASSOCIATES, INC. 7740 North 16th Street, Suite 300 Phoenix, Arizona 85020 (602) 944-5500					

City of Scottsdale
Drainage Design Management System
LAND USE
Project Reference: SOLITUDE PROP

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7/29/2020

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
OFF10	DESERT	0.0740	8.2	0.15	0	25.0	DRY	0.042	Desert
	GOLF	0.1020	11.3	0.44	0	60.0	NORMAL	0.023	Golf Course
	R1-18	0.5110	56.8	0.30	27	50.0	NORMAL	0.023	Residential 18,000 sq-ft lots
	R1-43	0.0650	7.2	0.30	17	20.0	NORMAL	0.023	Residential 43,000 sq-ft lots
	UND	0.1480	16.4	0.25	0	0.0	DRY	0.081	Undisturbed natural desert or desert landscaping (no impervi
		0.9000	99.9						
OFF15	DESERT	0.0020	100.0	0.15	0	25.0	DRY	0.076	Desert
		0.0020	100.0						
OFF20	DESERT	0.0080	100.0	0.15	0	25.0	DRY	0.070	Desert
		0.0080	100.0						
OFF30	DESERT	0.0260	74.3	0.15	0	25.0	DRY	0.061	Desert
	R1-43	0.0090	25.7	0.30	17	20.0	NORMAL	0.031	Residential 43,000 sq-ft lots
		0.0350	100.0						
OFF35	DESERT	0.0210	67.7	0.15	0	25.0	DRY	0.062	Desert
	R1-43	0.0100	32.3	0.30	17	20.0	NORMAL	0.032	Residential 43,000 sq-ft lots
		0.0310	100.0						
OFF40	R1-43	0.0040	100.0	0.30	17	20.0	NORMAL	0.037	Residential 43,000 sq-ft lots
		0.0040	100.0						
OFF45	DESERT	0.0220	27.2	0.15	0	25.0	DRY	0.056	Desert
	R1-43	0.0590	72.8	0.30	17	20.0	NORMAL	0.029	Residential 43,000 sq-ft lots

* Non default value

(stLuDataCG.rpt)

17-ZN-2019
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City of Scottsdale
Drainage Design Management System
LAND USE
Project Reference: SOLITUDE PROP

Page 2

7/29/2020

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0810	100.0						
OFF50	R1-43	0.0010	100.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0010	100.0						
ON10	DESERT	0.0030	100.0	0.15	0	25.0	DRY	0.076	Desert
		0.0030	100.0						
ON11	R1-43	0.0040	100.0	0.30	17	20.0	NORMAL	0.037	Residential 43,000 sq-ft lots
		0.0040	100.0						
ON15	R1-43	0.0010	100.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0010	100.0						
ON20	R1-43	0.0010	100.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0010	100.0						
ON25	R1-43	0.0010	100.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0010	100.0						
ON26	R1-43	0.0080	100.0	0.30	17	20.0	NORMAL	0.036	Residential 43,000 sq-ft lots
		0.0080	100.0						
ON27	DESERT	0.0010	100.0	0.15	0	25.0	DRY	0.083	Desert
		0.0010	100.0						
ON28	DESERT	0.0010	100.0	0.15	0	25.0	DRY	0.083	Desert
		0.0010	100.0						
ON30	R1-43	0.0020	100.0	0.30	17	20.0	NORMAL	0.039	Residential 43,000 sq-ft lots

* Non default value

(stLuDataCG.rpt)

17-ZN-2019
8/5/2020

City of Scottsdale
 Drainage Design Management System
LAND USE
 Project Reference: SOLITUDE PROP

Page 3

7/29/2020

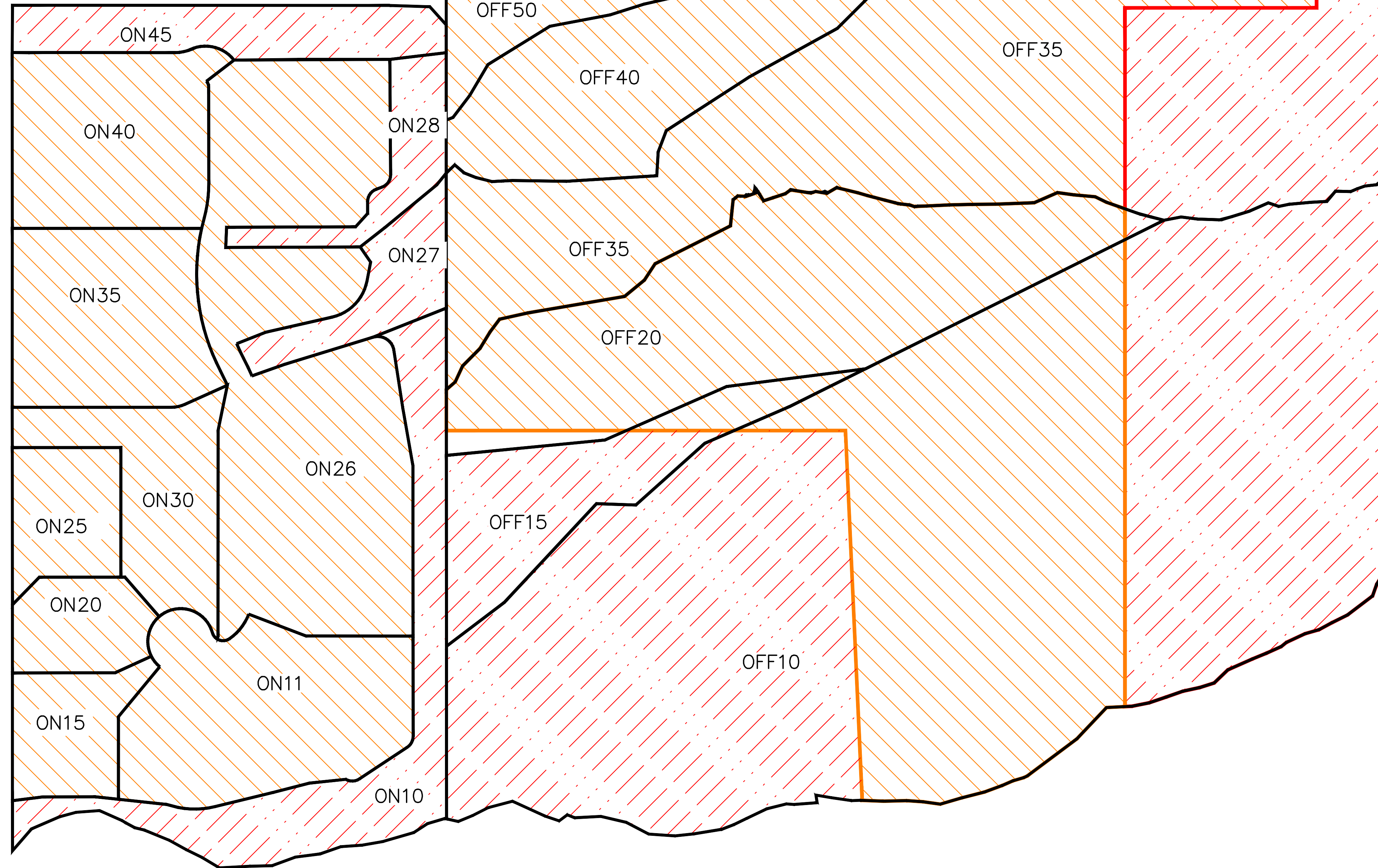
Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0020	100.0						
ON35	R1-43	0.0030	100.0	0.30	17	20.0	NORMAL	0.038	Residential 43,000 sq-ft lots
		0.0030	100.0						
ON40	R1-43	0.0030	100.0	0.30	17	20.0	NORMAL	0.038	Residential 43,000 sq-ft lots
		0.0030	100.0						
ON45	DESERT	0.0010	100.0	0.15	0	25.0	DRY	0.083	Desert
		0.0010	100.0						

* Non default value

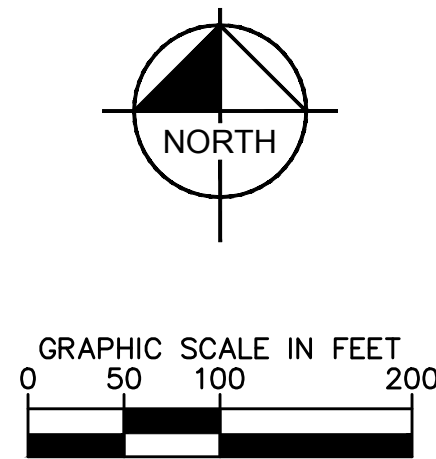
(stLuDataCG.rpt)

17-ZN-2019
 8/5/2020

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OFF-SITE
SEE EXISTING
CONDITION
LAND USE MAP



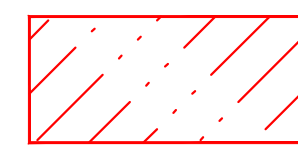
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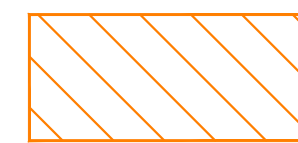
SUB-BASIN BOUNDARY

OFF10 SUB-BASIN ID

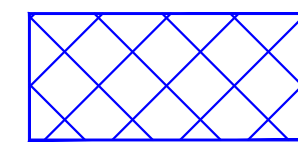
LAND USE



DESERT



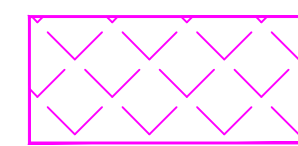
R1-43 43,000 SF/LOT



R1-18 18,000 SF/LOT



GOLF



UND

SCALE (H): 1"=100'
SCALE (V): NONE
DESIGNED BY: ZJH
DRAWN BY: ZJH
CHECKED BY: JMN
DATE: SEP 2019

Kimley»»Horn

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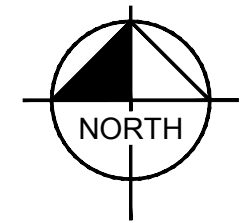
**SOLITUDE
PROPOSED CONDITION
HEC 1 - LAND USE MAP
SCOTTSDALE, ARIZONA**

PROJECT NO.

DRAWING NAME

1 OF 1

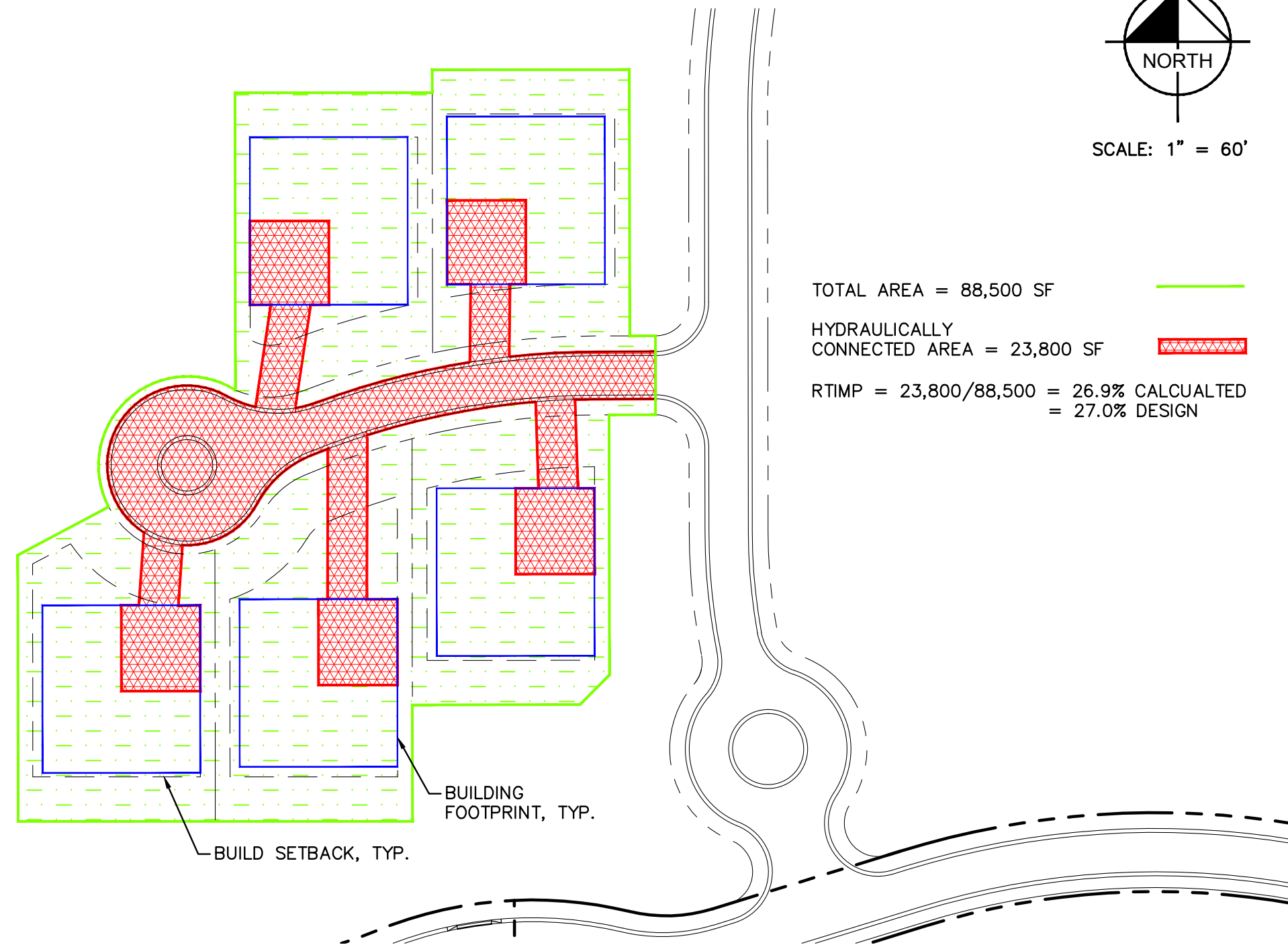
-ZN-2019
5/2020



SCALE: 1" = 60'

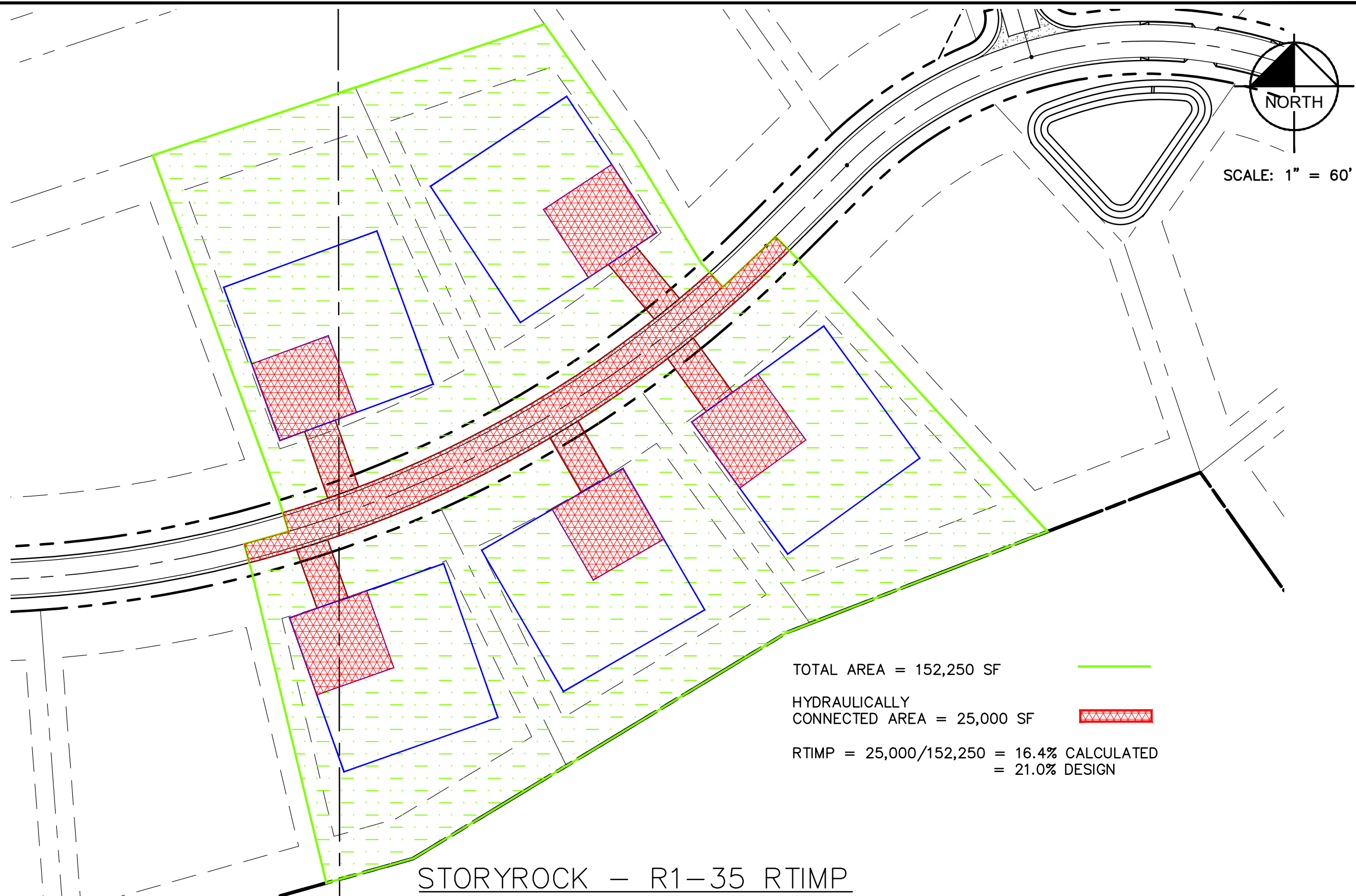
TOTAL AREA = 88,500 SF

HYDRAULICALLY
CONNECTED AREA = 23,800 SF

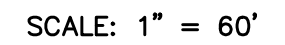
$$\begin{aligned} \text{RTIMP} &= 23,800/88,500 = 26.9\% \text{ CALCUALTED} \\ &= 27.0\% \text{ DESIGN} \end{aligned}$$


STORYROCK – R1-18 RTIMP
DETERMINATION

Kimley»»Horn



STORYROCK - R1-35 RTIMP
DETERMINATION





17.0% DESIGN



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City of Scottsdale
Drainage Design Management System
SOILS

Page 1

Project Reference: SOLITUDE PROP

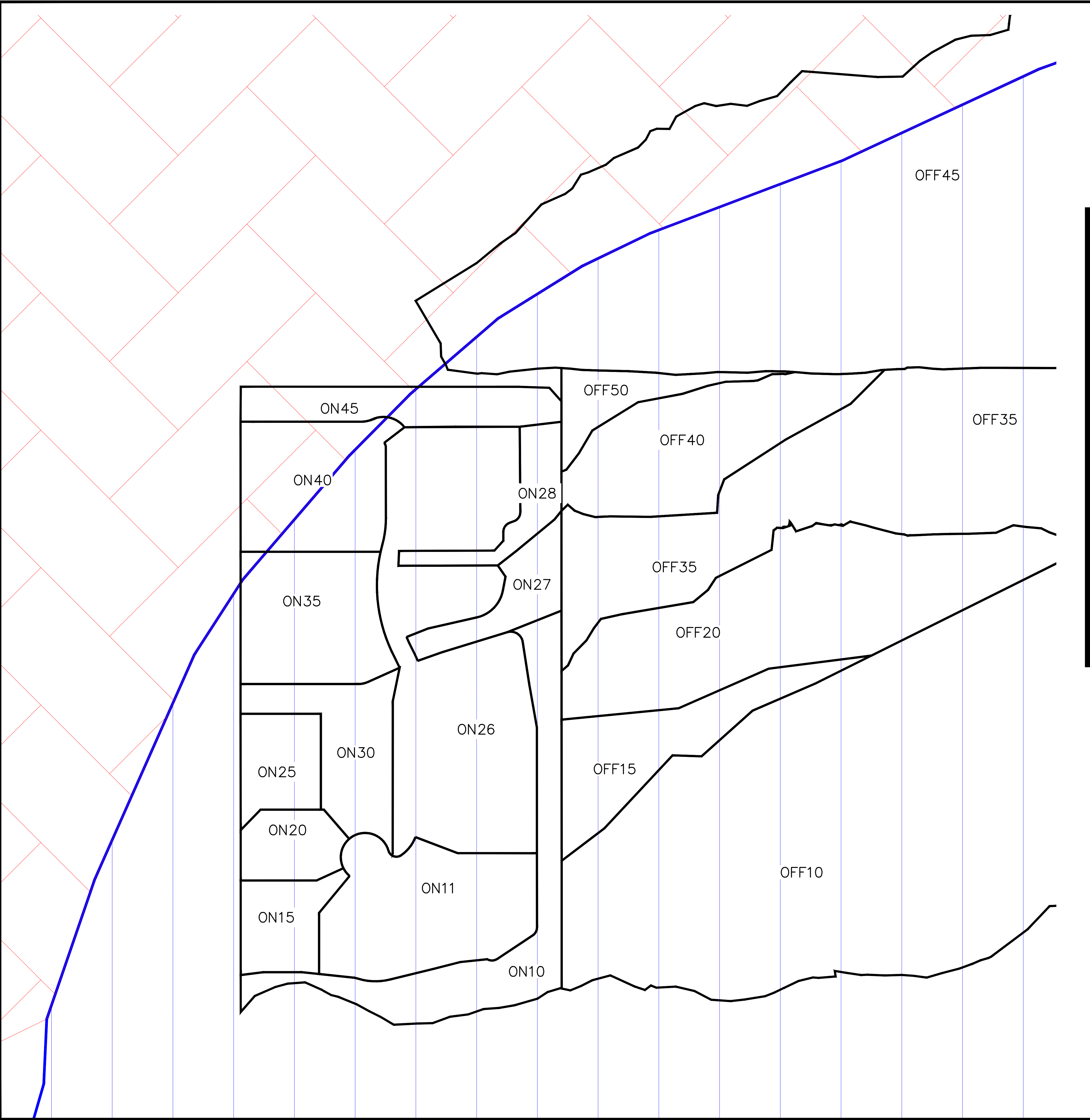
7/29/2020

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
OFF10	645	33	64533	0.165	18.30	0.230	-	100	
	645	61	64561	0.135	15.00	0.150	-	100	
	645	93	64593	0.168	18.60	0.330	-	100	
	645	121	645121	0.259	28.70	0.120	-	100	
	645	63	64563	0.174	19.30	0.140	25.00	100	
OFF15	645	121	645121	0.003	100.00	0.120	-	100	
OFF20	645	121	645121	0.008	100.00	0.120	-	100	
OFF30	645	121	645121	0.036	100.00	0.120	-	100	
OFF35	645	121	645121	0.031	100.00	0.120	-	100	
OFF40	645	121	645121	0.004	100.00	0.120	-	100	
OFF45	645	121	645121	0.059	72.80	0.120	-	100	
	645	6	6456	0.022	27.20	0.620	-	100	
OFF50	645	121	645121	0.001	100.00	0.120	-	100	
ON10	645	121	645121	0.003	100.00	0.120	-	100	
ON11	645	121	645121	0.004	100.00	0.120	-	100	
ON15	645	121	645121	0.001	100.00	0.120	-	100	
ON20	645	121	645121	0.001	100.00	0.120	-	100	
ON25	645	121	645121	0.001	100.00	0.120	-	100	
ON26	645	121	645121	0.008	100.00	0.120	-	100	
ON27	645	121	645121	0.001	100.00	0.120	-	100	
ON28	645	121	645121	0.001	100.00	0.120	-	100	
ON30	645	121	645121	0.002	100.00	0.120	-	100	
ON35	645	121	645121	0.003	100.00	0.120	-	100	
ON40	645	6	6456	0.001	50.00	0.620	-	100	
	645	121	645121	0.001	50.00	0.120	-	100	
ON45	645	6	6456	0.001	50.00	0.620	-	100	
	645	121	645121	0.001	50.00	0.120	-	100	

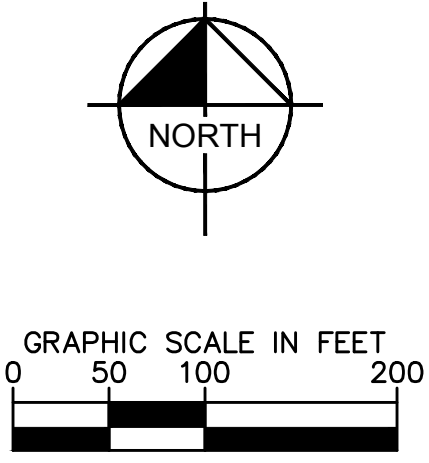
* Non default value

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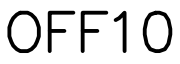
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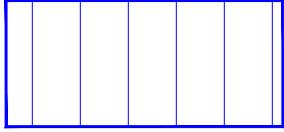
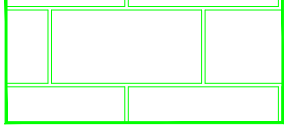
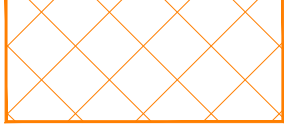
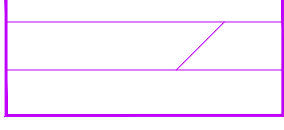
OFF-SITE
SEE EXISTING
CONDITION
SOILS MAP



LEGEND

-  SUB-BASIN BOUNDARY
-  SUB-BASIN ID

SOIL TYPES

-  121
-  6
-  93
-  63
-  33
-  61

SOLITUDE		PROJECT NO. 291203001	
PROPOSED CONDITION HEC 1 - SOILS MAP SCOTTSDALE, ARIZONA		DRAWING NAME	
1 OF 1		17-ZN-2019 8/5/2020	
NO.		REVISION	
BY		DATE	
APPR.		APPR.	



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City of Scottsdale
Drainage Design Management System
HEC-1 STORAGE FACILITIES

Page 1

7/29/2020

Storage Basin ID:		DB10										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)		-	-	0.1	0.1	0.1	0.2	0.2		
Spillway Length:	-NA-	Discharge (cfs)	0	0	0	1	1	1	1	15	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	0.5	1.0	1.5	2.0	2.5	3.0	3.0	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>				
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	0.07	0.00	0.07	0.00	0.00	0.19				
Length of Dam:	-NA-	Peak Stage (ft)	1.50	0.00	1.50	0.00	0.00	3.00				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	1.00	0.00	1.00	0.00	0.00	11.00				
Weir Coefficient:	-NA-											
Storage Basin ID:		DB26										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)		0.1	0.2	0.3	0.4	0.6	0.7	0.7		
Spillway Length:	-NA-	Discharge (cfs)	0	0	0	1	1	2	2	2	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	0.5	1.0	1.5	2.0	2.5	2.9	3.0	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>				
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	0.25	0.00	0.30	0.00	0.00	0.56				
Length of Dam:	-NA-	Peak Stage (ft)	1.31	0.00	1.50	0.00	0.00	2.50				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	0.00	0.00	1.00	0.00	0.00	2.00				
Weir Coefficient:	-NA-											

City of Scottsdale
Drainage Design Management System
HEC-1 STORAGE FACILITIES

Page 2

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Storage Basin ID:		DB35										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)		-	0.1	0.1	0.1	0.2	0.2	0.2		
Spillway Length:	-NA-	Discharge (cfs)	0	0	0	1	1	2	2	2	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	0.5	1.0	1.5	2.0	2.5	2.9	3.0	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>				
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	0.10	0.00	0.10	0.00	0.00	0.18				
Length of Dam:	-NA-	Peak Stage (ft)	1.50	0.00	1.50	0.00	0.00	2.50				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	1.00	0.00	1.00	0.00	0.00	2.00				
Weir Coefficient:	-NA-											

Project **Solitude**
 Subject **Detention Basin Calculations**
 Designed by **ZJH** Date 9/24/2019 Project No. 291203001
 Checked by **JMB** Date 9/24/2019

Objective: to determine the storage-flow relationship for small detention basins

DB10

Drains in 4.31 hours

Outlet Diameter 0.50 ft Outlet X-Sect Area 0.196 ft²
 Outlet Elevation 0.5 ft No. of Outlet Barrels 1
 Outlet Pipe Slope 0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft ²]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q _{pipe} [cfs]	Q _{weir} [cfs]	Total Q _{out} [cfs]
0	1,200	0.03	0.04	1.0	0.04	0	2.38	0	0	0
1	2,200	0.05	0.06	1.0	0.06	0.04	1.05	0	0	0
2	3,300	0.08	0.09	1.0	0.09	0.10	0.88	1	0	1
3	4,500	0.10				0.19		1	0	1

Notes:

Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
 per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

Project **Solitude**
 Subject **Detention Basin Calculations**
 Designed by **ZJH** Date 9/24/2019 Project No. 291203001
 Checked by **JMB** Date 9/24/2019

Objective: to determine the storage-flow relationship for small detention basins

DB26

Drains in 9.42 hours

Outlet Diameter 0.66 ft Outlet X-Sect Area 0.342 ft²
 Outlet Elevation 0.5 ft No. of Outlet Barrels 1
 Outlet Pipe Slope 0.005 ft/ft

Elevation	Surface Storage Area	Surface Storage Area	Average Area	Δ Elev	Δ Vol	Σ Vol	Δ Time to Drain	Q _{pipe}	Q _{weir}	Total Q _{out}
[ft]	[ft ²]	[acre]	[acre]	[ft]	[ac-ft]	[ac-ft]	[hr]	[cfs]	[cfs]	[cfs]
0	6,319	0.15	0.17	1.0	0.17	0	5.50	0	0	0
1	8,874	0.20	0.23	1.0	0.23	0.17	2.23	1	0	1
2	11,550	0.27	0.29	1.0	0.29	0.41	1.69	2	0	2
3	14,105	0.32				0.70		2	0	2

Notes:

Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
 per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

Project **Solitude**
 Subject **Detention Basin Calculations**
 Designed by **ZJH** Date 9/24/2019 Project No. 291203001
 Checked by **JMB** Date 9/24/2019

Objective: to determine the storage-flow relationship for small detention basins

DB35

Drains in 2.92 hours

Outlet Diameter 0.66 ft Outlet X-Sect Area 0.342 ft²
 Outlet Elevation 0.5 ft No. of Outlet Barrels 1
 Outlet Pipe Slope 0.005 ft/ft

Elevation	Surface Storage Area	Surface Storage Area	Average Area	Δ Elev	Δ Vol	Σ Vol	Δ Time to Drain	Q _{pipe}	Q _{weir}	Total Q _{out}
[ft]	[ft ²]	[acre]	[acre]	[ft]	[ac-ft]	[ac-ft]	[hr]	[cfs]	[cfs]	[cfs]
0	1,940	0.04	0.05	1.0	0.05	0	1.70	0	0	0
1	2,750	0.06	0.07	1.0	0.07	0.05	0.69	1	0	1
2	3,580	0.08	0.09	1.0	0.09	0.13	0.54	2	0	2
3	4,550	0.10				0.22		2	0	2

Notes:

Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
 per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

City of Scottsdale
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: SOLITUDE PROP

Page 1

9/25/2019

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
NORMAL DEPTH															
Major Basin 01															
R10	0.045	0.045	0.045	800.00	0.0275	-	X:	-	30.00	60.00	65.00	90.00	95.00	110.00	130.00
							Y:	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20
R15	0.045	0.045	0.045	370.00	0.0200	-	X:	-	2.00	8.00	10.00	12.00	16.00	20.00	30.00
							Y:	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00
R20	0.045	0.045	0.045	500.00	0.0200	-	X:	-	2.00	8.00	10.00	12.00	16.00	20.00	30.00
							Y:	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00
R30	0.045	0.045	0.045	300.00	0.0250	-	X:	-	10.00	20.00	26.00	30.00	34.00	40.00	50.00
							Y:	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20
R35	0.045	0.045	0.045	400.00	0.0250	-	X:	-	10.00	20.00	26.00	30.00	34.00	40.00	50.00
							Y:	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20
R40	0.045	0.045	0.045	500.00	0.0250	-	X:	-	10.00	20.00	26.00	30.00	34.00	40.00	50.00
							Y:	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20
R45	0.045	0.045	0.045	650.00	0.0250	-	X:	-	2.00	10.00	18.00	24.00	32.00	40.00	45.00
							Y:	10.20	10.10	10.00	7.50	7.50	10.00	10.10	10.20
RO45	0.045	0.045	0.045	1,773.00	0.0300	-	X:	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00
							Y:	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90

(stHe1Rt m)

17-ZN-2019
8/5/2020

City of Scottsdale
 Drainage Design Management System
 HEC-1 DIVERSIONS
 Project Reference: SOLITUDE PROP

Diversion ID/ DT Card ID	Maximum Volume (ac-ft)	Maximum Diversion (cfs)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
DOFF10		Inflow (cfs)		100	200	500	1,000	2,000	4,000	10,000	20,000	50,000
		Diversion (cfs)		85	170	425	850	1,700	3,400	8,500	17,000	42,500

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:50:46
*
*****
    
```

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*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
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      X   X  XXXXXX  XXXXX      X
      X   X  X      X   X      XX
      X   X  X      X           X
      XXXXXX XXXX  X      XXXXX  X
      X   X  X      X           X
      X   X  X      X   X      X
      X   X  XXXXXX  XXXXX      XXX
    
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1

HEC-1 INPUT

PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	City of Scottsdale									
2	ID	SOLITUDE PROP - Solitude Proposed Conditions Hydrology									
3	ID	2 YEAR									
4	ID	6 Hour Storm									
5	ID	Unit Hydrograph: Clark									
6	ID	Storm: Multiple									
7	ID	07/29/2020									
	*DIAGRAM										
8	IT	2	1JAN99	0	2000						
9	IO	5									
10	IN	15									
	*										
11	JD	1.342	0.0001								
12	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
13	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
14	PC	0.962	0.972	0.983	0.991	1.000					
15	JD	1.334	0.5000								
16	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
17	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
18	PC	0.962	0.972	0.983	0.991	1.000					
19	JD	1.308	2.8								
20	PC	0.000	0.009	0.016	0.025	0.034	0.042	0.051	0.059	0.067	0.076
21	PC	0.087	0.100	0.120	0.163	0.252	0.451	0.694	0.837	0.900	0.938
22	PC	0.950	0.963	0.975	0.988	1.000					
	*										
23	KK	OFF10	BASIN								
24	BA	0.900									
25	LG	0.30	0.28	5.58	0.23	21					
26	UC	0.766	0.743								
27	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
28	UA	100									
	*										
29	KK	DOFF10	DIVERT								
30	DT	DTFF10	0.0	0.0							
31	DI	0.0	100.0	200.0	500.0	1000.0	2000.0	4000.0	10000.0	20000.0	50000.0

32	DQ	0.0	85.0	170.0	425.0	850.0	1700.0	3400.0	8500.0	17000.0	42500.0
	*										
33	KK	OFF15	BASIN								
34	BA	0.003									
35	LG	0.15	0.37	6.54	0.14	0					
36	UC	0.238	0.379								
37	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
38	UA	100									
	*										
39	KK	R15	ROUTE								
40	RS	1	FLOW								
41	RC	0.045	0.045	0.045	370	0.0200	0.00				
42	RX	0.00	2.00	8.00	10.00	12.00	16.00	20.00	30.00		
43	RY	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00		
	*										

1

HEC-1 INPUT

PAGE 2

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

44	KK	OFF20	BASIN								
45	BA	0.008									
46	LG	0.15	0.37	6.54	0.14	0					
47	UC	0.298	0.435								
48	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
49	UA	100									
	*										
50	KK	R20	ROUTE								
51	RS	1	FLOW								
52	RC	0.045	0.045	0.045	500	0.0200	0.00				
53	RX	0.00	2.00	8.00	10.00	12.00	16.00	20.00	30.00		
54	RY	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00		
	*										
55	KK	CP011	COMBINE								
56	HC	3									
	*										
57	KK	R10	ROUTE								
58	RS	1	FLOW								
59	RC	0.045	0.045	0.045	800	0.0275	0.00				
60	RX	0.00	30.00	60.00	65.00	90.00	95.00	110.00	130.00		
61	RY	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20		
	*										
62	KK	ON11	BASIN								
63	BA	0.004									
64	LG	0.30	0.19	6.54	0.13	17					
65	UC	0.178	0.217								
66	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
67	UA	100									
	*										
68	KK	DB10	STORAGE								
69	KO										
70	RS	1	STOR								
71	SV		0.02	0.04	0.07	0.10	0.05	0.19	0.19		
72	SQ				1.00	1.00	1.00	1.00	15.00		
73	SE		0.50	1.00	1.50	2.00	2.50	2.95	3.00		
	*										
74	KK	ON10	BASIN								
75	BA	0.003									
76	LG	0.15	0.37	6.54	0.14	0					
77	UC	0.283	0.548								
78	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
79	UA	100									
	*										

1

HEC-1 INPUT

PAGE 3

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

80	KK	CP10	COMBINE									
81	HC	3										
	*											
82	KK	ON15	BASIN									
83	BA	0.001										
84	LG	0.30	0.19	6.54	0.13	17						
85	UC	0.156	0.287									
86	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
87	UA	100										
	*											
88	KK	ON20	BASIN									
89	BA	0.001										
90	LG	0.30	0.19	6.54	0.13	17						
91	UC	0.174	0.362									
92	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
93	UA	100										
	*											
94	KK	ON25	BASIN									
95	BA	0.001										
96	LG	0.30	0.19	6.54	0.13	17						
97	UC	0.135	0.246									
98	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
99	UA	100										
	*											
100	KK	OFF35	BASIN									
101	BA	0.031										
102	LG	0.20	0.31	6.54	0.14	5						
103	UC	0.519	1.084									
104	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
105	UA	100										
	*											
106	KK	R35	ROUTE									
107	RS	1	FLOW									
108	RC	0.045	0.045	0.045	400	0.0250	0.00					
109	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00			
110	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20			
	*											
111	KK	ON27	BASIN									
112	BA	0.001										
113	LG	0.15	0.37	6.54	0.14	0						
114	UC	0.204	0.430									
115	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
116	UA	100										
	*											

1

HEC-1 INPUT

PAGE 4

LINE	ID	1	2	3	4	5	6	7	8	9	10	
117	KK	CP27	COMBINE									
118	HC	2										
	*											
119	KK	R30	ROUTE									
120	RS	1	FLOW									
121	RC	0.045	0.045	0.045	300	0.0250	0.00					
122	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00			
123	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20			
	*											
124	KK	ON26	BASIN									
125	BA	0.008										
126	LG	0.30	0.19	6.54	0.13	17						
127	UC	0.277	0.354									
128	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
129	UA	100										
	*											

130	KK	DB26	STORAGE								
131	KO										
132	RS	1	STOR								
133	SV		0.10	0.17	0.30	0.41	0.56	0.70	0.71		
134	SQ				1.00	1.00	2.00	2.00	2.00		
135	SE		0.50	1.00	1.50	2.00	2.50	2.90	3.00		
	*										
136	KK	R30	ROUTE								
137	RS	1	FLOW								
138	RC	0.045	0.045	0.045	300	0.0250	0.00				
139	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00		
140	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20		
	*										
141	KK	ON30	BASIN								
142	BA	0.002									
143	LG	0.30	0.19	6.54	0.13	17					
144	UC	0.222	0.380								
145	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
146	UA	100									
	*										
147	KK	CP30	COMBINE								
148	HC	3									
	*										
149	KK	X1	COMBINE								
150	HC	5									
	*										

1

HEC-1 INPUT

PAGE 5

LINE	ID	1	2	3	4	5	6	7	8	9	10
151	KK	OFF40	BASIN								
152	BA	0.004									
153	LG	0.30	0.19	6.54	0.13	17					
154	UC	0.166	0.258								
155	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
156	UA	100									
	*										
157	KK	R40	ROUTE								
158	RS	1	FLOW								
159	RC	0.045	0.045	0.045	500	0.0250	0.00				
160	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00		
161	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20		
	*										
162	KK	ON28	BASIN								
163	BA	0.001									
164	LG	0.15	0.37	6.54	0.14	0					
165	UC	0.231	0.592								
166	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
167	UA	100									
	*										
168	KK	CP28	COMBINE								
169	HC	2									
	*										
170	KK	ON35	BASIN								
171	BA	0.003									
172	LG	0.30	0.19	6.54	0.13	17					
173	UC	0.145	0.158								
174	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
175	UA	100									
	*										
176	KK	DB35	STORAGE								
177	KO										
178	RS	1	STOR								
179	SV		0.03	0.05	0.10	0.13	0.18	0.22	0.22		
180	SQ				1.00	1.00	2.00	2.00	2.00		

181	SE		0.50	1.00	1.50	2.00	2.50	2.90	3.00		
	*										
182	KK	C035	COMBINE								
183	HC	2									
	*										
184	KK	ON40	BASIN								
185	BA	0.003									
186	LG	0.30	0.25	4.72	0.30	17					
187	UC	0.189	0.252								
188	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
189	UA	100									
	*										

1

HEC-1 INPUT

PAGE 6

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

190	KK	OFF30	BASIN								
191	BA	0.036									
192	LG	0.19	0.32	6.54	0.14	4					
193	UC	0.453	0.778								
194	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
195	UA	100									
	*										

196	KK	R045	ROUTE								
197	RS	1	FLOW								
198	RC	0.045	0.045	0.045	1773	0.0300	0.00				
199	RX	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00		
200	RY	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90		
	*										

201	KK	OFF45	BASIN								
202	BA	0.081									
203	LG	0.26	0.29	5.46	0.21	12					
204	UC	0.442	0.601								
205	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
206	UA	100									
	*										

207	KK	CP045	COMBINE								
208	HC	2									
	*										

209	KK	R45	ROUTE								
210	RS	1	FLOW								
211	RC	0.045	0.045	0.045	650	0.0250	0.00				
212	RX	0.00	2.00	10.00	18.00	24.00	32.00	40.00	45.00		
213	RY	10.20	10.10	10.00	7.50	7.50	10.00	10.10	10.20		
	*										

214	KK	OFF50	BASIN								
215	BA	0.001									
216	LG	0.30	0.19	6.54	0.13	17					
217	UC	0.126	0.253								
218	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
219	UA	100									
	*										

220	KK	R45	ROUTE								
221	RS	1	FLOW								
222	RC	0.045	0.045	0.045	650	0.0250	0.00				
223	RX	0.00	2.00	10.00	18.00	24.00	32.00	40.00	45.00		
224	RY	10.20	10.10	10.00	7.50	7.50	10.00	10.10	10.20		
	*										

1

HEC-1 INPUT

PAGE 7

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

225	KK	ON45	BASIN								
226	BA	0.001									
227	LG	0.15	0.35	4.72	0.32	0					

228	UC	0.290	0.879									
229	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
230	UA	100										
	*											
231	KK	CP45	COMBINE									
232	HC	3										
	*											
233	ZZ											

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
23	OFF10	
	.	
30	.	DTFF10
29	DOFF10	
	.	
33	OFF15	
	V	
	V	
39	R15	
	.	
44	.	OFF20
	.	V
	.	V
50	.	R20
	.	.
	.	.
55	CP011.....	
	V	
	V	
57	R10	
	.	
62	ON11	
	V	
	V	
68	DB10	
	.	
	.	
74	.	ON10
	.	.
	.	.
80	CP10.....	
	.	
82	ON15	
	.	
	.	
88	.	ON20
	.	.
	.	.
94	.	ON25
	.	.
	.	.
100	.	OFF35
	.	V
	.	V
106	.	R35
	.	.
	.	.
111	.	ON27
	.	.
	.	.
117	.	CP27.....
	.	V
	.	V
119	.	R30

```

(*** ) RUNOFF ALSO COMPUTED AT THIS LOCATION
*****
*                                     *
*   FLOOD HYDROGRAPH PACKAGE   (HEC-1)   *
*           JUN   1998           *

```

17-ZN-2019
8/5/2020

* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*

[illegible]

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

19 JD INDEX STORM NO. 3
 STRM 1.31 PRECIPITATION DEPTH
 TRDA 2.80 TRANSPOSITION DRAINAGE AREA

20 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.02	.02	.02	.02	.02	.02	.02	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

*** **

68 KK *****
 * *
 * DB10 * STORAGE
 * *

69 K0 OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

*** **

130 KK *****
 * *
 * DB26 * STORAGE
 * *

131 K0 OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

*** **

```

*****
*          *
176 KK    *    DB35    *    STORAGE
*          *
*****
    
```

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177 K0      OUTPUT CONTROL VARIABLES
              IPRNT      5  PRINT CONTROL
              IPLOT      0  PLOT CONTROL
              QSCAL      0.  HYDROGRAPH PLOT SCALE
    
```

1

RUNOFF SUMMARY
 FLOW IN CUBIC FEET PER SECOND
 TIME IN HOURS, AREA IN SQUARE MILES

+	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
					6-HOUR	24-HOUR	72-HOUR			
+	HYDROGRAPH AT	OFF10	186.	4.57	42.	11.	4.	.90		
+	DIVERSION TO	DTFF10	158.	4.57	36.	9.	3.	.90		
+	HYDROGRAPH AT	DOFF10	28.	4.57	6.	2.	1.	.90		
+	HYDROGRAPH AT	OFF15	1.	4.17	0.	0.	0.	.00		
+	ROUTED TO	R15	1.	4.20	0.	0.	0.	.00		
+	HYDROGRAPH AT	OFF20	3.	4.20	0.	0.	0.	.01		
+	ROUTED TO	R20	3.	4.27	0.	0.	0.	.01		
+	3 COMBINED AT	CP011	30.	4.53	7.	2.	1.	.91		
+	ROUTED TO	R10	29.	4.60	7.	2.	1.	.91		
+	HYDROGRAPH AT	ON11	3.	4.10	0.	0.	0.	.00		
+	ROUTED TO	DB10	1.	4.20	0.	0.	0.	.00		
+	HYDROGRAPH AT	ON10	1.	4.20	0.	0.	0.	.00		
+	3 COMBINED AT	CP10	30.	4.60	7.	2.	1.	.92		
+	HYDROGRAPH AT	ON15	1.	4.10	0.	0.	0.	.00		
+	HYDROGRAPH AT	ON20	1.	4.10	0.	0.	0.	.00		
+	HYDROGRAPH AT	ON25	1.	4.07	0.	0.	0.	.00		
+	HYDROGRAPH AT	OFF35	6.	4.40	1.	0.	0.	.03		
+	ROUTED TO	R35	6.	4.43	1.	0.	0.	.03		

+	HYDROGRAPH AT	ON27	0.	4.13	0.	0.	0.	.00
+	2 COMBINED AT	CP27	6.	4.43	1.	0.	0.	.03
+	ROUTED TO	R30	6.	4.43	1.	0.	0.	.03
+	HYDROGRAPH AT	ON26	5.	4.17	1.	0.	0.	.01
+	ROUTED TO	DB26	0.	5.13	0.	0.	0.	.01
+	ROUTED TO	R30	0.	5.20	0.	0.	0.	.01
+	HYDROGRAPH AT	ON30	1.	4.13	0.	0.	0.	.00
+	3 COMBINED AT	CP30	7.	4.43	2.	0.	0.	.04
+	5 COMBINED AT	X1	35.	4.60	8.	2.	1.	.96
+	HYDROGRAPH AT	OFF40	3.	4.10	0.	0.	0.	.00
+	ROUTED TO	R40	3.	4.13	0.	0.	0.	.00
+	HYDROGRAPH AT	ON28	0.	4.17	0.	0.	0.	.00
+	2 COMBINED AT	CP28	3.	4.13	0.	0.	0.	.01
+	HYDROGRAPH AT	ON35	3.	4.07	0.	0.	0.	.00
+	ROUTED TO	DB35	1.	4.40	0.	0.	0.	.00
+	2 COMBINED AT	C035	3.	4.17	0.	0.	0.	.01
+	HYDROGRAPH AT	ON40	2.	4.10	0.	0.	0.	.00
+	HYDROGRAPH AT	OFF30	9.	4.33	2.	0.	0.	.04
+	ROUTED TO	R045	7.	4.60	2.	0.	0.	.04
+	HYDROGRAPH AT	OFF45	25.	4.30	4.	1.	0.	.08
+	2 COMBINED AT	CP045	29.	4.33	5.	1.	1.	.12
+	ROUTED TO	R45	29.	4.40	5.	1.	1.	.12
+	HYDROGRAPH AT	OFF50	1.	4.07	0.	0.	0.	.00
+	ROUTED TO	R45	1.	4.17	0.	0.	0.	.00
+	HYDROGRAPH AT	ON45	0.	4.20	0.	0.	0.	.00

	3 COMBINED AT						
+		CP45	29.	4.40	6.	1.	1.
							.12

*** NORMAL END OF HEC-1 ***

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:51:04
*
*****
    
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*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
```

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      X  X  XXXXXX  XXXXX  X
      X  X  X      X      XX
      X  X  X      X      X
      XXXXXX XXXX  X      XXXXX X
      X  X  X      X      X
      X  X  X      X      X
      X  X  XXXXXX  XXXXX  XXX
    
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1

HEC-1 INPUT

PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	City of Scottsdale									
2	ID	SOLITUDE PROP - Solitude Proposed Conditions Hydrology									
3	ID	10 YEAR									
4	ID	6 Hour Storm									
5	ID	Unit Hydrograph: Clark									
6	ID	Storm: Multiple									
7	ID	07/29/2020									
	*DIAGRAM										
8	IT	2	1JAN99	0	2000						
9	IO	5									
10	IN	15									
	*										
11	JD	1.995	0.0001								
12	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
13	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
14	PC	0.962	0.972	0.983	0.991	1.000					
15	JD	1.983	0.5000								
16	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
17	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
18	PC	0.962	0.972	0.983	0.991	1.000					
19	JD	1.945	2.8								
20	PC	0.000	0.009	0.016	0.025	0.034	0.042	0.051	0.059	0.067	0.076
21	PC	0.087	0.100	0.120	0.163	0.252	0.451	0.694	0.837	0.900	0.938
22	PC	0.950	0.963	0.975	0.988	1.000					
	*										
23	KK	OFF10	BASIN								
24	BA	0.900									
25	LG	0.30	0.28	5.58	0.23	21					
26	UC	0.671	0.642								
27	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
28	UA	100									
	*										
29	KK	DOFF10	DIVERT								
30	DT	DTFF10	0.0	0.0							
31	DI	0.0	100.0	200.0	500.0	1000.0	2000.0	4000.0	10000.0	20000.0	50000.0

32	DQ	0.0	85.0	170.0	425.0	850.0	1700.0	3400.0	8500.0	17000.0	42500.0
	*										
33	KK	OFF15	BASIN								
34	BA	0.003									
35	LG	0.15	0.37	6.54	0.14	0					
36	UC	0.209	0.327								
37	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
38	UA	100									
	*										
39	KK	R15	ROUTE								
40	RS	1	FLOW								
41	RC	0.045	0.045	0.045	370	0.0200	0.00				
42	RX	0.00	2.00	8.00	10.00	12.00	16.00	20.00	30.00		
43	RY	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00		
	*										

1

HEC-1 INPUT

PAGE 2

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

44	KK	OFF20	BASIN								
45	BA	0.008									
46	LG	0.15	0.37	6.54	0.14	0					
47	UC	0.261	0.375								
48	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
49	UA	100									
	*										
50	KK	R20	ROUTE								
51	RS	1	FLOW								
52	RC	0.045	0.045	0.045	500	0.0200	0.00				
53	RX	0.00	2.00	8.00	10.00	12.00	16.00	20.00	30.00		
54	RY	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00		
	*										
55	KK	CP011	COMBINE								
56	HC	3									
	*										
57	KK	R10	ROUTE								
58	RS	1	FLOW								
59	RC	0.045	0.045	0.045	800	0.0275	0.00				
60	RX	0.00	30.00	60.00	65.00	90.00	95.00	110.00	130.00		
61	RY	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20		
	*										
62	KK	ON11	BASIN								
63	BA	0.004									
64	LG	0.30	0.19	6.54	0.13	17					
65	UC	0.158	0.189								
66	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
67	UA	100									
	*										
68	KK	DB10	STORAGE								
69	KO										
70	RS	1	STOR								
71	SV		0.02	0.04	0.07	0.10	0.05	0.19	0.19		
72	SQ				1.00	1.00	1.00	1.00	15.00		
73	SE		0.50	1.00	1.50	2.00	2.50	2.95	3.00		
	*										
74	KK	ON10	BASIN								
75	BA	0.003									
76	LG	0.15	0.37	6.54	0.14	0					
77	UC	0.248	0.472								
78	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
79	UA	100									
	*										

1

HEC-1 INPUT

PAGE 3

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

80	KK	CP10	COMBINE									
81	HC	3										
	*											
82	KK	ON15	BASIN									
83	BA	0.001										
84	LG	0.30	0.19	6.54	0.13	17						
85	UC	0.138	0.251									
86	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
87	UA	100										
	*											
88	KK	ON20	BASIN									
89	BA	0.001										
90	LG	0.30	0.19	6.54	0.13	17						
91	UC	0.154	0.316									
92	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
93	UA	100										
	*											
94	KK	ON25	BASIN									
95	BA	0.001										
96	LG	0.30	0.19	6.54	0.13	17						
97	UC	0.120	0.215									
98	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
99	UA	100										
	*											
100	KK	OFF35	BASIN									
101	BA	0.031										
102	LG	0.20	0.31	6.54	0.14	5						
103	UC	0.456	0.937									
104	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
105	UA	100										
	*											
106	KK	R35	ROUTE									
107	RS	1	FLOW									
108	RC	0.045	0.045	0.045	400	0.0250	0.00					
109	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00			
110	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20			
	*											
111	KK	ON27	BASIN									
112	BA	0.001										
113	LG	0.15	0.37	6.54	0.14	0						
114	UC	0.178	0.371									
115	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
116	UA	100										
	*											

1

HEC-1 INPUT

PAGE 4

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117	KK	CP27	COMBINE									
118	HC	2										
	*											
119	KK	R30	ROUTE									
120	RS	1	FLOW									
121	RC	0.045	0.045	0.045	300	0.0250	0.00					
122	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00			
123	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20			
	*											
124	KK	ON26	BASIN									
125	BA	0.008										
126	LG	0.30	0.19	6.54	0.13	17						
127	UC	0.246	0.309									
128	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
129	UA	100										
	*											

130	KK	DB26	STORAGE								
131	KO										
132	RS	1	STOR								
133	SV		0.10	0.17	0.30	0.41	0.56	0.70	0.71		
134	SQ				1.00	1.00	2.00	2.00	2.00		
135	SE		0.50	1.00	1.50	2.00	2.50	2.90	3.00		
	*										
136	KK	R30	ROUTE								
137	RS	1	FLOW								
138	RC	0.045	0.045	0.045	300	0.0250	0.00				
139	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00		
140	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20		
	*										
141	KK	ON30	BASIN								
142	BA	0.002									
143	LG	0.30	0.19	6.54	0.13	17					
144	UC	0.196	0.333								
145	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
146	UA	100									
	*										
147	KK	CP30	COMBINE								
148	HC	3									
	*										
149	KK	X1	COMBINE								
150	HC	5									
	*										

1

HEC-1 INPUT

PAGE 5

LINE	ID	1	2	3	4	5	6	7	8	9	10
151	KK	OFF40	BASIN								
152	BA	0.004									
153	LG	0.30	0.19	6.54	0.13	17					
154	UC	0.147	0.226								
155	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
156	UA	100									
	*										
157	KK	R40	ROUTE								
158	RS	1	FLOW								
159	RC	0.045	0.045	0.045	500	0.0250	0.00				
160	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00		
161	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20		
	*										
162	KK	ON28	BASIN								
163	BA	0.001									
164	LG	0.15	0.37	6.54	0.14	0					
165	UC	0.202	0.511								
166	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
167	UA	100									
	*										
168	KK	CP28	COMBINE								
169	HC	2									
	*										
170	KK	ON35	BASIN								
171	BA	0.003									
172	LG	0.30	0.19	6.54	0.13	17					
173	UC	0.129	0.138								
174	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
175	UA	100									
	*										
176	KK	DB35	STORAGE								
177	KO										
178	RS	1	STOR								
179	SV		0.03	0.05	0.10	0.13	0.18	0.22	0.22		
180	SQ				1.00	1.00	2.00	2.00	2.00		

181	SE		0.50	1.00	1.50	2.00	2.50	2.90	3.00		
	*										
182	KK	C035	COMBINE								
183	HC	2									
	*										
184	KK	ON40	BASIN								
185	BA	0.003									
186	LG	0.30	0.25	4.72	0.30	17					
187	UC	0.168	0.221								
188	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
189	UA	100									
	*										

1

HEC-1 INPUT

PAGE 6

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

190	KK	OFF30	BASIN								
191	BA	0.036									
192	LG	0.19	0.32	6.54	0.14	4					
193	UC	0.398	0.672								
194	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
195	UA	100									
	*										

196	KK	R045	ROUTE								
197	RS	1	FLOW								
198	RC	0.045	0.045	0.045	1773	0.0300	0.00				
199	RX	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00		
200	RY	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90		
	*										

201	KK	OFF45	BASIN								
202	BA	0.081									
203	LG	0.26	0.29	5.46	0.21	12					
204	UC	0.392	0.526								
205	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
206	UA	100									
	*										

207	KK	CP045	COMBINE								
208	HC	2									
	*										

209	KK	R45	ROUTE								
210	RS	1	FLOW								
211	RC	0.045	0.045	0.045	650	0.0250	0.00				
212	RX	0.00	2.00	10.00	18.00	24.00	32.00	40.00	45.00		
213	RY	10.20	10.10	10.00	7.50	7.50	10.00	10.10	10.20		
	*										

214	KK	OFF50	BASIN								
215	BA	0.001									
216	LG	0.30	0.19	6.54	0.13	17					
217	UC	0.112	0.222								
218	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
219	UA	100									
	*										

220	KK	R45	ROUTE								
221	RS	1	FLOW								
222	RC	0.045	0.045	0.045	650	0.0250	0.00				
223	RX	0.00	2.00	10.00	18.00	24.00	32.00	40.00	45.00		
224	RY	10.20	10.10	10.00	7.50	7.50	10.00	10.10	10.20		
	*										

1

HEC-1 INPUT

PAGE 7

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

225	KK	ON45	BASIN								
226	BA	0.001									
227	LG	0.15	0.35	4.72	0.32	0					

228	UC	0.252	0.753									
229	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
230	UA	100										
	*											
231	KK	CP45	COMBINE									
232	HC	3										
	*											
233	ZZ											

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
23	OFF10	
	.	
30	.	DTFF10
29	DOFF10	
	.	
33	.	OFF15
	.	V
	.	V
39	.	R15
	.	.
44	.	OFF20
	.	V
	.	V
50	.	R20
	.	.
	.	.
55	CP011.....	
	V	
	V	
57	R10	
	.	
62	.	ON11
	.	V
	.	V
68	.	DB10
	.	.
	.	.
74	.	ON10
	.	.
	.	.
80	CP10.....	
	.	
82	.	ON15
	.	.
	.	.
88	.	ON20
	.	.
	.	.
94	.	ON25
	.	.
	.	.
100	.	OFF35
	.	V
	.	V
106	.	R35
	.	.
	.	.
111	.	ON27
	.	.
	.	.
117	.	CP27.....
	.	V
	.	V
119	.	R30

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

19 JD INDEX STORM NO. 3
 STRM 1.95 PRECIPITATION DEPTH
 TRDA 2.80 TRANSPOSITION DRAINAGE AREA

20 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.02	.02	.02	.02	.02	.02	.02	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

*** **

68 KK *****
 * *
 * DB10 * STORAGE
 * *

69 K0 OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

*** **

130 KK *****
 * *
 * DB26 * STORAGE
 * *

131 K0 OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

*** **

```

*****
*           *
176 KK      *   DB35   *   STORAGE
*           *
*****
    
```

```

177 K0      OUTPUT CONTROL VARIABLES
              IPRNT      5 PRINT CONTROL
              IPLOT      0 PLOT CONTROL
              QSCAL      0. HYDROGRAPH PLOT SCALE
    
```

1

RUNOFF SUMMARY
 FLOW IN CUBIC FEET PER SECOND
 TIME IN HOURS, AREA IN SQUARE MILES

+	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
					6-HOUR	24-HOUR	72-HOUR			
+	HYDROGRAPH AT	OFF10	439.	4.47	85.	22.	8.	.90		
+	DIVERSION TO	DTFF10	374.	4.47	72.	18.	7.	.90		
+	HYDROGRAPH AT	DOFF10	66.	4.47	13.	3.	1.	.90		
+	HYDROGRAPH AT	OFF15	3.	4.13	0.	0.	0.	.00		
+	ROUTED TO	R15	3.	4.17	0.	0.	0.	.00		
+	HYDROGRAPH AT	OFF20	7.	4.17	1.	0.	0.	.01		
+	ROUTED TO	R20	7.	4.20	1.	0.	0.	.01		
+	3 COMBINED AT	CP011	71.	4.47	14.	3.	1.	.91		
+	ROUTED TO	R10	70.	4.50	14.	3.	1.	.91		
+	HYDROGRAPH AT	ON11	6.	4.07	0.	0.	0.	.00		
+	ROUTED TO	DB10	1.	4.03	0.	0.	0.	.00		
+	HYDROGRAPH AT	ON10	2.	4.17	0.	0.	0.	.00		
+	3 COMBINED AT	CP10	72.	4.50	14.	4.	1.	.92		
+	HYDROGRAPH AT	ON15	1.	4.07	0.	0.	0.	.00		
+	HYDROGRAPH AT	ON20	1.	4.10	0.	0.	0.	.00		
+	HYDROGRAPH AT	ON25	1.	4.07	0.	0.	0.	.00		
+	HYDROGRAPH AT	OFF35	14.	4.33	3.	1.	0.	.03		
+	ROUTED TO	R35	14.	4.37	3.	1.	0.	.03		

+	HYDROGRAPH AT	ON27	1.	4.10	0.	0.	0.	.00
+	2 COMBINED AT	CP27	15.	4.37	3.	1.	0.	.03
+	ROUTED TO	R30	15.	4.37	3.	1.	0.	.03
+	HYDROGRAPH AT	ON26	9.	4.17	1.	0.	0.	.01
+	ROUTED TO	DB26	1.	4.37	1.	0.	0.	.01
+	ROUTED TO	R30	1.	4.53	1.	0.	0.	.01
+	HYDROGRAPH AT	ON30	2.	4.13	0.	0.	0.	.00
+	3 COMBINED AT	CP30	17.	4.37	4.	1.	0.	.04
+	5 COMBINED AT	X1	86.	4.50	18.	5.	2.	.96
+	HYDROGRAPH AT	OFF40	6.	4.07	0.	0.	0.	.00
+	ROUTED TO	R40	5.	4.10	0.	0.	0.	.00
+	HYDROGRAPH AT	ON28	1.	4.13	0.	0.	0.	.00
+	2 COMBINED AT	CP28	6.	4.10	1.	0.	0.	.01
+	HYDROGRAPH AT	ON35	5.	4.07	0.	0.	0.	.00
+	ROUTED TO	DB35	1.	4.37	0.	0.	0.	.00
+	2 COMBINED AT	C035	7.	4.10	1.	0.	0.	.01
+	HYDROGRAPH AT	ON40	4.	4.10	0.	0.	0.	.00
+	HYDROGRAPH AT	OFF30	21.	4.27	3.	1.	0.	.04
+	ROUTED TO	R045	17.	4.50	3.	1.	0.	.04
+	HYDROGRAPH AT	OFF45	55.	4.27	8.	2.	1.	.08
+	2 COMBINED AT	CP045	67.	4.30	11.	3.	1.	.12
+	ROUTED TO	R45	66.	4.33	11.	3.	1.	.12
+	HYDROGRAPH AT	OFF50	1.	4.07	0.	0.	0.	.00
+	ROUTED TO	R45	1.	4.13	0.	0.	0.	.00
+	HYDROGRAPH AT	ON45	0.	4.17	0.	0.	0.	.00

	3 COMBINED AT						
+		CP45	67.	4.33	11.	3.	1.
							.12

*** NORMAL END OF HEC-1 ***

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 29JUL20 TIME 10:51:53
*
*****
    
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*****
*
* U.S. ARMY CORPS OF ENGINEER
* HYDROLOGIC ENGINEERING CENT
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
```

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      X   X  XXXXXX  XXXXX      X
      X   X  X      X   X      XX
      X   X  X      X           X
      XXXXXX XXXX  X      XXXXX  X
      X   X  X      X           X
      X   X  X      X   X      X
      X   X  XXXXXX  XXXXX      XXX
    
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1

HEC-1 INPUT

PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	City of Scottsdale									
2	ID	SOLITUDE PROP - Solitude Proposed Conditions Hydrology									
3	ID	100 YEAR									
4	ID	6 Hour Storm									
5	ID	Unit Hydrograph: Clark									
6	ID	Storm: Multiple									
7	ID	07/29/2020									
	*DIAGRAM										
8	IT	2	1JAN99	0	2000						
9	IO	5									
10	IN	15									
	*										
11	JD	3.024	0.0001								
12	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
13	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
14	PC	0.962	0.972	0.983	0.991	1.000					
15	JD	3.006	0.5000								
16	PC	0.000	0.008	0.016	0.025	0.033	0.041	0.050	0.058	0.066	0.074
17	PC	0.087	0.099	0.118	0.138	0.216	0.377	0.834	0.911	0.931	0.950
18	PC	0.962	0.972	0.983	0.991	1.000					
19	JD	2.948	2.8								
20	PC	0.000	0.009	0.016	0.025	0.034	0.042	0.051	0.059	0.067	0.076
21	PC	0.087	0.100	0.120	0.163	0.252	0.451	0.694	0.837	0.900	0.938
22	PC	0.950	0.963	0.975	0.988	1.000					
	*										
23	KK	OFF10	BASIN								
24	BA	0.900									
25	LG	0.30	0.28	5.58	0.23	21					
26	UC	0.515	0.478								
27	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
28	UA	100									
	*										
29	KK	DOFF10	DIVERT								
30	DT	DTFF10	0.0	0.0							
31	DI	0.0	100.0	200.0	500.0	1000.0	2000.0	4000.0	10000.0	20000.0	50000.0

32	DQ	0.0	85.0	170.0	425.0	850.0	1700.0	3400.0	8500.0	17000.0	42500.0
	*										
33	KK	OFF15	BASIN								
34	BA	0.003									
35	LG	0.15	0.37	6.54	0.14	0					
36	UC	0.161	0.244								
37	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
38	UA	100									
	*										
39	KK	R15	ROUTE								
40	RS	1	FLOW								
41	RC	0.045	0.045	0.045	370	0.0200	0.00				
42	RX	0.00	2.00	8.00	10.00	12.00	16.00	20.00	30.00		
43	RY	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00		
	*										

1

HEC-1 INPUT

PAGE 2

LINE	ID	1	2	3	4	5	6	7	8	9	10
44	KK	OFF20	BASIN								
45	BA	0.008									
46	LG	0.15	0.37	6.54	0.14	0					
47	UC	0.201	0.281								
48	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
49	UA	100									
	*										
50	KK	R20	ROUTE								
51	RS	1	FLOW								
52	RC	0.045	0.045	0.045	500	0.0200	0.00				
53	RX	0.00	2.00	8.00	10.00	12.00	16.00	20.00	30.00		
54	RY	10.00	10.00	10.00	9.00	9.00	10.00	10.00	10.00		
	*										
55	KK	CP011	COMBINE								
56	HC	3									
	*										
57	KK	R10	ROUTE								
58	RS	1	FLOW								
59	RC	0.045	0.045	0.045	800	0.0275	0.00				
60	RX	0.00	30.00	60.00	65.00	90.00	95.00	110.00	130.00		
61	RY	10.20	10.10	10.00	9.00	9.00	10.00	10.10	10.20		
	*										
62	KK	ON11	BASIN								
63	BA	0.004									
64	LG	0.30	0.19	6.54	0.13	17					
65	UC	0.126	0.148								
66	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
67	UA	100									
	*										
68	KK	DB10	STORAGE								
69	KO										
70	RS	1	STOR								
71	SV		0.02	0.04	0.07	0.10	0.05	0.19	0.19		
72	SQ				1.00	1.00	1.00	1.00	15.00		
73	SE		0.50	1.00	1.50	2.00	2.50	2.95	3.00		
	*										
74	KK	ON10	BASIN								
75	BA	0.003									
76	LG	0.15	0.37	6.54	0.14	0					
77	UC	0.191	0.353								
78	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
79	UA	100									
	*										

1

HEC-1 INPUT

PAGE 3

LINE	ID	1	2	3	4	5	6	7	8	9	10
------	----	---	---	---	---	---	---	---	---	---	----

80	KK	CP10	COMBINE									
81	HC	3										
	*											
82	KK	ON15	BASIN									
83	BA	0.001										
84	LG	0.30	0.19	6.54	0.13	17						
85	UC	0.110	0.196									
86	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
87	UA	100										
	*											
88	KK	ON20	BASIN									
89	BA	0.001										
90	LG	0.30	0.19	6.54	0.13	17						
91	UC	0.123	0.247									
92	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
93	UA	100										
	*											
94	KK	ON25	BASIN									
95	BA	0.001										
96	LG	0.30	0.19	6.54	0.13	17						
97	UC	0.096	0.168									
98	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
99	UA	100										
	*											
100	KK	OFF35	BASIN									
101	BA	0.031										
102	LG	0.20	0.31	6.54	0.14	5						
103	UC	0.355	0.711									
104	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
105	UA	100										
	*											
106	KK	R35	ROUTE									
107	RS	1	FLOW									
108	RC	0.045	0.045	0.045	400	0.0250	0.00					
109	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00			
110	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20			
	*											
111	KK	ON27	BASIN									
112	BA	0.001										
113	LG	0.15	0.37	6.54	0.14	0						
114	UC	0.137	0.277									
115	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
116	UA	100										
	*											

1

HEC-1 INPUT

PAGE 4

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117	KK	CP27	COMBINE									
118	HC	2										
	*											
119	KK	R30	ROUTE									
120	RS	1	FLOW									
121	RC	0.045	0.045	0.045	300	0.0250	0.00					
122	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00			
123	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20			
	*											
124	KK	ON26	BASIN									
125	BA	0.008										
126	LG	0.30	0.19	6.54	0.13	17						
127	UC	0.196	0.241									
128	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
129	UA	100										
	*											

130	KK	DB26	STORAGE								
131	KO										
132	RS	1	STOR								
133	SV		0.10	0.17	0.30	0.41	0.56	0.70	0.71		
134	SQ				1.00	1.00	2.00	2.00	2.00		
135	SE		0.50	1.00	1.50	2.00	2.50	2.90	3.00		
	*										
136	KK	R30	ROUTE								
137	RS	1	FLOW								
138	RC	0.045	0.045	0.045	300	0.0250	0.00				
139	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00		
140	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20		
	*										
141	KK	ON30	BASIN								
142	BA	0.002									
143	LG	0.30	0.19	6.54	0.13	17					
144	UC	0.157	0.260								
145	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
146	UA	100									
	*										
147	KK	CP30	COMBINE								
148	HC	3									
	*										
149	KK	X1	COMBINE								
150	HC	5									
	*										

1

HEC-1 INPUT

PAGE 5

LINE	ID	1	2	3	4	5	6	7	8	9	10
151	KK	OFF40	BASIN								
152	BA	0.004									
153	LG	0.30	0.19	6.54	0.13	17					
154	UC	0.118	0.176								
155	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
156	UA	100									
	*										
157	KK	R40	ROUTE								
158	RS	1	FLOW								
159	RC	0.045	0.045	0.045	500	0.0250	0.00				
160	RX	0.00	10.00	20.00	26.00	30.00	34.00	40.00	50.00		
161	RY	10.20	10.10	10.00	8.00	8.00	10.00	10.10	10.20		
	*										
162	KK	ON28	BASIN								
163	BA	0.001									
164	LG	0.15	0.37	6.54	0.14	0					
165	UC	0.156	0.382								
166	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
167	UA	100									
	*										
168	KK	CP28	COMBINE								
169	HC	2									
	*										
170	KK	ON35	BASIN								
171	BA	0.003									
172	LG	0.30	0.19	6.54	0.13	17					
173	UC	0.103	0.108								
174	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
175	UA	100									
	*										
176	KK	DB35	STORAGE								
177	KO										
178	RS	1	STOR								
179	SV		0.03	0.05	0.10	0.13	0.18	0.22	0.22		
180	SQ				1.00	1.00	2.00	2.00	2.00		

181	SE		0.50	1.00	1.50	2.00	2.50	2.90	3.00		
	*										
182	KK	C035	COMBINE								
183	HC	2									
	*										
184	KK	ON40	BASIN								
185	BA	0.003									
186	LG	0.30	0.25	4.72	0.30	17					
187	UC	0.131	0.168								
188	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
189	UA	100									
	*										

1

HEC-1 INPUT

PAGE 6

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

190	KK	OFF30	BASIN								
191	BA	0.036									
192	LG	0.19	0.32	6.54	0.14	4					
193	UC	0.309	0.509								
194	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
195	UA	100									
	*										

196	KK	R045	ROUTE								
197	RS	1	FLOW								
198	RC	0.045	0.045	0.045	1773	0.0300	0.00				
199	RX	610.00	620.00	637.00	650.00	663.00	679.00	689.00	697.00		
200	RY	139.00	138.70	138.30	138.50	138.80	139.00	138.90	138.90		
	*										

201	KK	OFF45	BASIN								
202	BA	0.081									
203	LG	0.26	0.29	5.46	0.21	12					
204	UC	0.303	0.396								
205	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
206	UA	100									
	*										

207	KK	CP045	COMBINE								
208	HC	2									
	*										

209	KK	R45	ROUTE								
210	RS	1	FLOW								
211	RC	0.045	0.045	0.045	650	0.0250	0.00				
212	RX	0.00	2.00	10.00	18.00	24.00	32.00	40.00	45.00		
213	RY	10.20	10.10	10.00	7.50	7.50	10.00	10.10	10.20		
	*										

214	KK	OFF50	BASIN								
215	BA	0.001									
216	LG	0.30	0.19	6.54	0.13	17					
217	UC	0.090	0.173								
218	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
219	UA	100									
	*										

220	KK	R45	ROUTE								
221	RS	1	FLOW								
222	RC	0.045	0.045	0.045	650	0.0250	0.00				
223	RX	0.00	2.00	10.00	18.00	24.00	32.00	40.00	45.00		
224	RY	10.20	10.10	10.00	7.50	7.50	10.00	10.10	10.20		
	*										

1

HEC-1 INPUT

PAGE 7

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

225	KK	ON45	BASIN								
226	BA	0.001									
227	LG	0.15	0.35	4.72	0.32	0					

228	UC	0.190	0.552									
229	UA	0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0	
230	UA	100										
	*											
231	KK	CP45	COMBINE									
232	HC	3										
	*											
233	ZZ											

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
23	OFF10	
	.	
30	.	DTFF10
29	DOFF10	
	.	
33	.	OFF15
	.	V
	.	V
39	.	R15
	.	.
44	.	OFF20
	.	V
	.	V
50	.	R20
	.	.
	.	.
55	CP011.....	
	V	
	V	
57	R10	
	.	
62	.	ON11
	.	V
	.	V
68	.	DB10
	.	.
	.	.
74	.	ON10
	.	.
	.	.
80	CP10.....	
	.	
82	.	ON15
	.	.
	.	.
88	.	ON20
	.	.
	.	.
94	.	ON25
	.	.
	.	.
100	.	OFF35
	.	V
	.	V
106	.	R35
	.	.
	.	.
111	.	ON27
	.	.
	.	.
117	.	CP27.....
	.	V
	.	V
119	.	R30

* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*

[illegible]

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.02	.02	.02	.02	.02
.02	.02	.04	.06	.06	.06	.06	.06	.06	.06
.01	.01	.01	.01	.01	.01	.01	.01	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

19 JD INDEX STORM NO. 3
 STRM 2.95 PRECIPITATION DEPTH
 TRDA 2.80 TRANSPOSITION DRAINAGE AREA

20 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.02	.02	.02	.02	.02	.02	.02	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

*** **

68 KK DB10 STORAGE

69 K0 OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

*** **

130 KK DB26 STORAGE

131 K0 OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

*** **

```
*****
*           *
176 KK      *   DB35   *   STORAGE
*           *
*****
```

```
177 K0      OUTPUT CONTROL VARIABLES
              IPRNT      5  PRINT CONTROL
              IPLOT      0  PLOT CONTROL
              QSCAL      0.  HYDROGRAPH PLOT SCALE
```

Appendix C – Hydraulics

Flowmaster Cross Sections (Existing and Proposed Conditions)

- Flowmaster Output
- Cross Sections

HY-8 Output:

- Preliminary Culvert Calculations

HY-8 Culvert Calculation Output

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 29 cfs

Design Flow: 68 cfs

Maximum Flow: 158 cfs

Table 1 - Summary of Culvert Flows at Crossing: Culvert A

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert A Discharge (cfs)	Roadway Discharge (cfs)	Iterations
102.33	29.00	29.00	0.00	1
102.64	41.90	41.90	0.00	1
102.93	54.80	54.80	0.00	1
103.19	67.70	67.70	0.00	1
103.19	68.00	68.00	0.00	1
103.65	93.50	93.50	0.00	1
103.88	106.40	106.40	0.00	1
104.12	119.30	119.30	0.00	1
104.38	132.20	132.20	0.00	1
104.66	145.10	145.10	0.00	1
104.96	158.00	158.00	0.00	1
105.00	159.42	159.42	0.00	Overtopping

Rating Curve Plot for Crossing: Culvert A

Table 2 - Culvert Summary Table: Culvert A

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
29.00	29.00	102.33	1.327	0.029	1-S2n	0.682	0.980	0.714	0.495	7.233	4.187
41.90	41.90	102.64	1.641	0.290	1-S2n	0.821	1.187	0.869	0.621	7.938	4.819
54.80	54.80	102.93	1.934	0.544	1-S2n	0.944	1.369	1.007	0.734	8.470	5.333
67.70	67.70	103.19	2.189	0.796	1-S2n	1.055	1.528	1.134	0.838	8.902	5.773
68.00	68.00	103.19	2.195	0.801	1-S2n	1.058	1.531	1.137	0.840	8.911	5.783
93.50	93.50	103.65	2.649	1.318	1-S2n	1.258	1.808	1.367	1.026	9.609	6.507
106.40	106.40	103.88	2.877	1.593	1-S2n	1.354	1.932	1.476	1.114	9.911	6.822
119.30	119.30	104.12	3.118	1.882	5-S2n	1.446	2.051	1.582	1.198	10.180	7.112
132.20	132.20	104.38	3.376	2.180	5-S2n	1.537	2.160	1.684	1.279	10.448	7.381
145.10	145.10	104.66	3.658	2.860	5-S2n	1.628	2.262	1.784	1.358	10.702	7.632
158.00	158.00	104.96	3.964	3.135	5-S2n	1.718	2.356	1.882	1.434	10.943	7.868

Straight Culvert

Inlet Elevation (invert): 101.00 ft, Outlet Elevation (invert): 100.00 ft

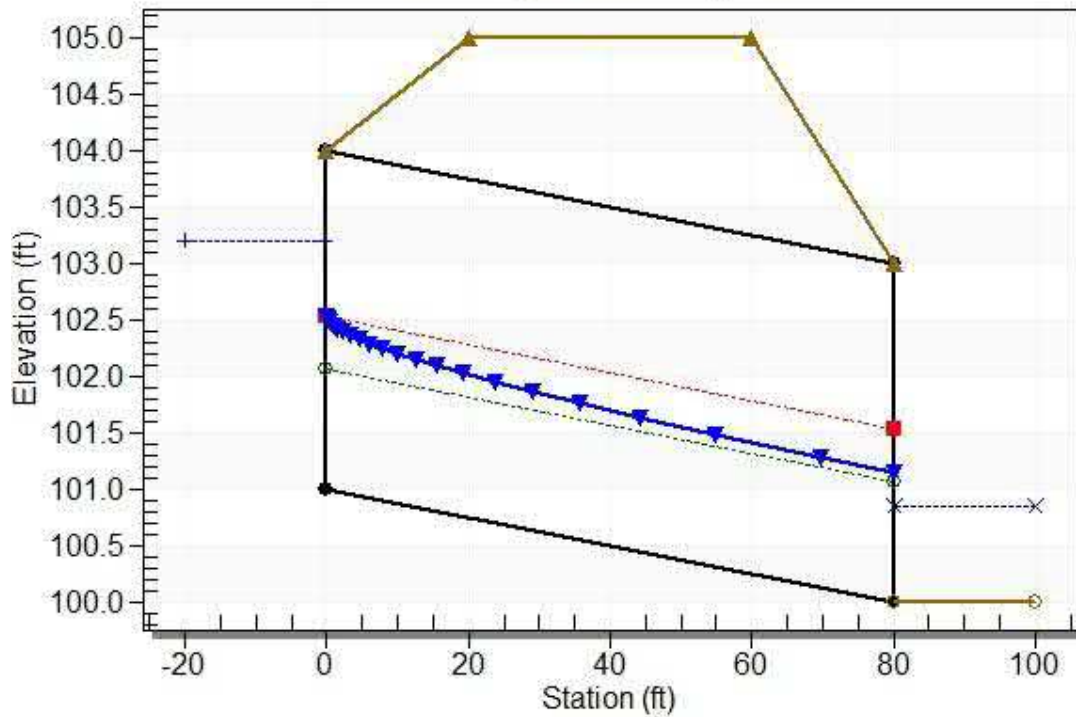
Culvert Length: 80.01 ft, Culvert Slope: 0.0125

Culvert Performance Curve Plot: Culvert A

Water Surface Profile Plot for Culvert: Culvert A

Crossing - Culvert A, Design Discharge - 68.0 cfs

Culvert - Culvert A, Culvert Discharge - 68.0 cfs



Site Data - Culvert A

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 101.00 ft

Outlet Station: 80.00 ft

Outlet Elevation: 100.00 ft

Number of Barrels: 3

Culvert Data Summary - Culvert A

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Culvert A)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
29.00	100.49	0.49	4.19	0.62	1.05
41.90	100.62	0.62	4.82	0.78	1.08
54.80	100.73	0.73	5.33	0.92	1.10
67.70	100.84	0.84	5.77	1.05	1.11
68.00	100.84	0.84	5.78	1.05	1.11
93.50	101.03	1.03	6.51	1.28	1.13
106.40	101.11	1.11	6.82	1.39	1.14
119.30	101.20	1.20	7.11	1.50	1.15
132.20	101.28	1.28	7.38	1.60	1.15
145.10	101.36	1.36	7.63	1.69	1.15
158.00	101.43	1.43	7.87	1.79	1.16

Tailwater Channel Data - Culvert A

Tailwater Channel Option: Rectangular Channel

Bottom Width: 14.00 ft

Channel Slope: 0.0200

Channel Manning's n: 0.0300

Channel Invert Elevation: 100.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 3 cfs

Design Flow: 6 cfs

Maximum Flow: 12 cfs

Table 4 - Summary of Culvert Flows at Crossing: Culvert B

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert B Discharge (cfs)	Roadway Discharge (cfs)	Iterations
111.81	3.00	3.00	0.00	1
111.93	3.90	3.90	0.00	1
112.05	4.80	4.80	0.00	1
112.17	5.70	5.70	0.00	1
112.20	6.00	6.00	0.00	1
112.38	7.50	7.50	0.00	1
112.47	8.40	8.40	0.00	1
112.56	9.30	9.30	0.00	1
112.65	10.20	10.20	0.00	1
112.74	11.10	11.10	0.00	1
112.82	12.00	12.00	0.00	1
115.00	27.32	27.32	0.00	Overtopping

Rating Curve Plot for Crossing: Culvert B

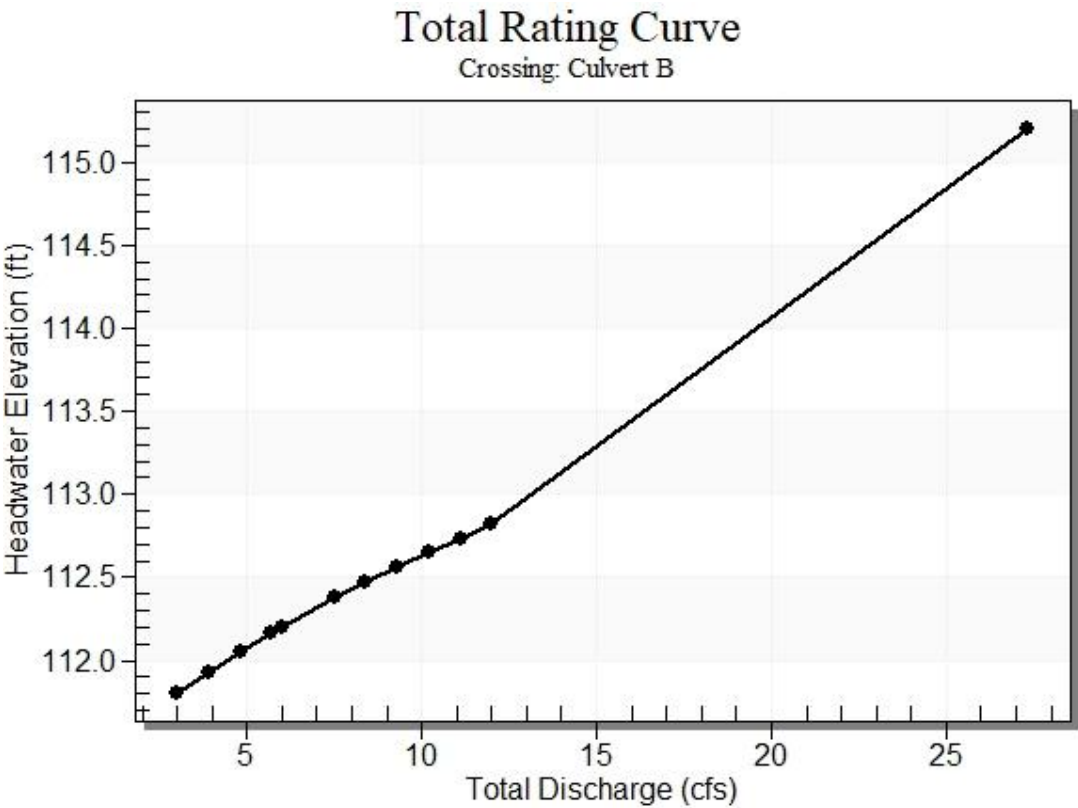


Table 5 - Culvert Summary Table: Culvert B

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
3.00	3.00	111.81	0.808	0.0*	1-S2n	0.374	0.601	0.394	0.428	6.633	3.506
3.90	3.90	111.93	0.929	0.0*	1-S2n	0.427	0.688	0.453	0.512	7.071	3.806
4.80	4.80	112.05	1.047	0.0*	1-S2n	0.473	0.765	0.507	0.592	7.425	4.051
5.70	5.70	112.17	1.167	0.0*	1-S2n	0.517	0.841	0.556	0.669	7.729	4.258
6.00	6.00	112.20	1.204	0.0*	1-S2n	0.530	0.865	0.573	0.694	7.783	4.321
7.50	7.50	112.38	1.376	0.121	1-S2n	0.595	0.974	0.649	0.816	8.203	4.595
8.40	8.40	112.47	1.471	0.217	1-S2n	0.631	1.032	0.693	0.887	8.394	4.735
9.30	9.30	112.56	1.561	0.313	1-S2n	0.666	1.086	0.735	0.957	8.577	4.860
10.20	10.20	112.65	1.649	0.413	1-S2n	0.699	1.141	0.775	1.025	8.755	4.975
11.10	11.10	112.74	1.735	0.514	1-S2n	0.731	1.191	0.815	1.093	8.925	5.079
12.00	12.00	112.82	1.822	0.616	1-S2n	0.763	1.239	0.853	1.160	9.074	5.174

* Full Flow Headwater elevation is below inlet invert.

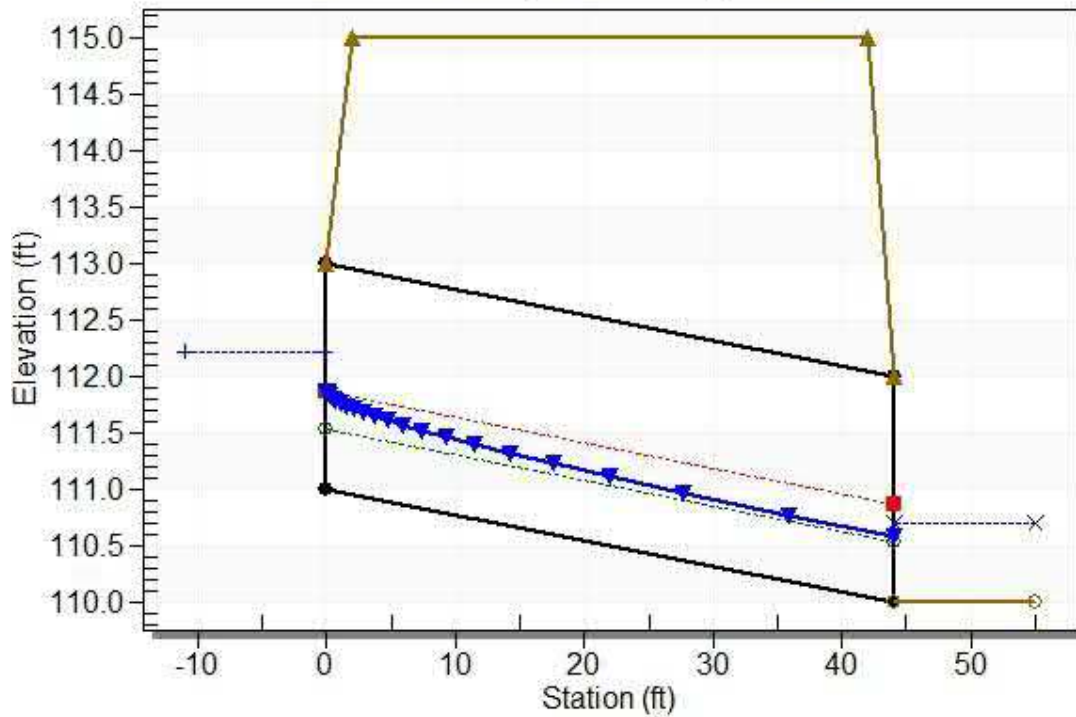
```
*****  
                                Straight Culvert  
Inlet Elevation (invert): 111.00 ft,   Outlet Elevation (invert): 110.00 ft  
Culvert Length: 44.01 ft,   Culvert Slope: 0.0227  
*****
```

Culvert Performance Curve Plot: Culvert B

Water Surface Profile Plot for Culvert: Culvert B

Crossing - Culvert B, Design Discharge - 6.0 cfs

Culvert - Culvert B, Culvert Discharge - 6.0 cfs



Site Data - Culvert B

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 111.00 ft

Outlet Station: 44.00 ft

Outlet Elevation: 110.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert B

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1)

Inlet Depression: None

Table 6 - Downstream Channel Rating Curve (Crossing: Culvert B)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
3.00	110.43	0.43	3.51	0.67	0.94
3.90	110.51	0.51	3.81	0.80	0.94
4.80	110.59	0.59	4.05	0.92	0.93
5.70	110.67	0.67	4.26	1.04	0.92
6.00	110.69	0.69	4.32	1.08	0.91
7.50	110.82	0.82	4.60	1.27	0.90
8.40	110.89	0.89	4.74	1.38	0.89
9.30	110.96	0.96	4.86	1.49	0.88
10.20	111.03	1.03	4.97	1.60	0.87
11.10	111.09	1.09	5.08	1.70	0.86
12.00	111.16	1.16	5.17	1.81	0.85

Tailwater Channel Data - Culvert B

Tailwater Channel Option: Rectangular Channel

Bottom Width: 2.00 ft

Channel Slope: 0.0250

Channel Manning's n: 0.0300

Channel Invert Elevation: 110.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 6 cfs

Design Flow: 15 cfs

Maximum Flow: 34 cfs

Table 7 - Summary of Culvert Flows at Crossing: Culvert C

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert C Discharge (cfs)	Roadway Discharge (cfs)	Iterations
110.02	6.00	6.00	0.00	1
110.25	8.80	8.80	0.00	1
110.45	11.60	11.60	0.00	1
110.65	14.40	14.40	0.00	1
110.69	15.00	15.00	0.00	1
111.02	20.00	20.00	0.00	1
111.18	22.80	22.80	0.00	1
111.33	25.60	25.60	0.00	1
111.48	28.40	28.40	0.00	1
111.63	31.20	31.20	0.00	1
111.78	34.00	34.00	0.00	1
112.00	38.08	38.08	0.00	Overtopping

Rating Curve Plot for Crossing: Culvert C

Table 8 - Culvert Summary Table: Culvert C

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
6.00	6.00	110.02	1.019	0.0*	1-S2n	0.444	0.766	0.464	0.251	8.317	2.991
8.80	8.80	110.25	1.247	0.0*	1-S2n	0.537	0.932	0.559	0.318	9.348	3.464
11.60	11.60	110.45	1.446	0.0*	1-S2n	0.615	1.075	0.651	0.377	9.913	3.848
14.40	14.40	110.65	1.651	0.0*	1-S2n	0.685	1.204	0.726	0.431	10.529	4.175
15.00	15.00	110.69	1.694	0.0*	1-S2n	0.699	1.231	0.732	0.442	10.844	4.239
20.00	20.00	111.02	2.018	0.0*	1-S2n	0.808	1.436	0.867	0.530	11.398	4.720
22.80	22.80	111.18	2.180	0.0*	1-S2n	0.864	1.536	0.930	0.575	11.792	4.954
25.60	25.60	111.33	2.333	0.0*	1-S2n	0.918	1.629	0.988	0.619	12.175	5.169
28.40	28.40	111.48	2.481	0.0*	1-S2n	0.969	1.721	1.052	0.661	12.401	5.368
31.20	31.20	111.63	2.628	0.0*	1-S2n	1.019	1.809	1.106	0.702	12.736	5.555
34.00	34.00	111.78	2.776	0.0*	1-S2n	1.066	1.890	1.166	0.742	12.929	5.729

* Full Flow Headwater elevation is below inlet invert.

Straight Culvert

Inlet Elevation (invert): 109.00 ft, Outlet Elevation (invert): 106.00 ft

Culvert Length: 110.04 ft, Culvert Slope: 0.0273

Culvert Performance Curve Plot: Culvert C

Water Surface Profile Plot for Culvert: Culvert C

Site Data - Culvert C

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 109.00 ft

Outlet Station: 110.00 ft

Outlet Elevation: 106.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert C

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1)

Inlet Depression: None

Table 9 - Downstream Channel Rating Curve (Crossing: Culvert C)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
6.00	106.25	0.25	2.99	0.39	1.05
8.80	106.32	0.32	3.46	0.50	1.08
11.60	106.38	0.38	3.85	0.59	1.10
14.40	106.43	0.43	4.17	0.67	1.12
15.00	106.44	0.44	4.24	0.69	1.12
20.00	106.53	0.53	4.72	0.83	1.14
22.80	106.58	0.58	4.95	0.90	1.15
25.60	106.62	0.62	5.17	0.97	1.16
28.40	106.66	0.66	5.37	1.03	1.16
31.20	106.70	0.70	5.55	1.10	1.17
34.00	106.74	0.74	5.73	1.16	1.17

Tailwater Channel Data - Culvert C

Tailwater Channel Option: Rectangular Channel

Bottom Width: 8.00 ft

Channel Slope: 0.0250

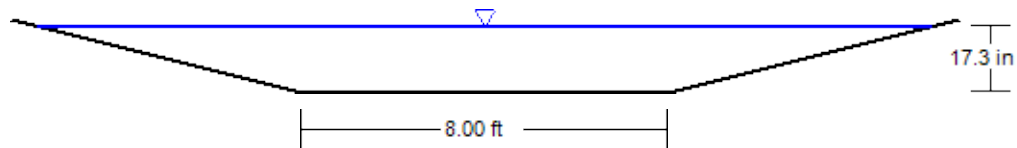
Channel Manning's n: 0.0300

Channel Invert Elevation: 106.00 ft

Wash Cross Sections Existing Condition

Cross Section for Chnl A

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.040
Channel Slope	0.040 ft/ft
Normal Depth	17.3 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	8.00 ft
Discharge	148.00 cfs

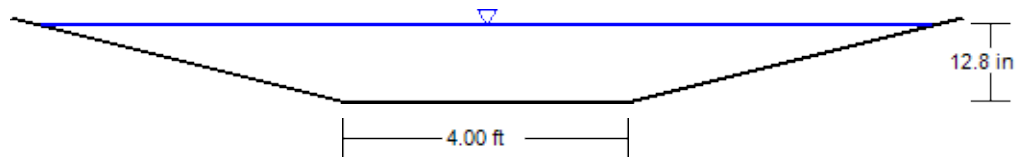


Worksheet for Chnl A

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.040
Channel Slope	0.040 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	8.00 ft
Discharge	148.00 cfs
Results	
Normal Depth	17.3 in
Flow Area	19.9 ft ²
Wetted Perimeter	19.9 ft
Hydraulic Radius	12.0 in
Top Width	19.56 ft
Critical Depth	20.0 in
Critical Slope	0.023 ft/ft
Velocity	7.43 ft/s
Velocity Head	0.86 ft
Specific Energy	2.30 ft
Froude Number	1.298
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	17.3 in
Critical Depth	20.0 in
Channel Slope	0.040 ft/ft
Critical Slope	0.023 ft/ft

Cross Section for Chnl C

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.040
Channel Slope	0.030 ft/ft
Normal Depth	12.8 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	4.00 ft
Discharge	44.00 cfs



V: 1
H: 1

Worksheet for Chnl C

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.040
Channel Slope	0.030 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	4.00 ft
Discharge	44.00 cfs
Results	
Normal Depth	12.8 in
Flow Area	8.8 ft ²
Wetted Perimeter	12.8 ft
Hydraulic Radius	8.2 in
Top Width	12.51 ft
Critical Depth	13.1 in
Critical Slope	0.027 ft/ft
Velocity	5.01 ft/s
Velocity Head	0.39 ft
Specific Energy	1.45 ft
Froude Number	1.055
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	12.8 in
Critical Depth	13.1 in
Channel Slope	0.030 ft/ft
Critical Slope	0.027 ft/ft

Worksheet for EX A1

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Channel Slope	0.022 ft/ft
Discharge	155.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	9.50
0+24	8.00
0+32	6.50
0+40	6.50
0+54	7.00
0+72	8.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 9.50)	(0+72, 8.00)	0.030

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	13.1 in
Elevation Range	6.5 to 9.5 ft
Flow Area	26.9 ft ²
Wetted Perimeter	38.6 ft
Hydraulic Radius	8.4 in
Top Width	38.49 ft
Normal Depth	13.1 in
Critical Depth	14.4 in
Critical Slope	0.014 ft/ft
Velocity	5.77 ft/s
Velocity Head	0.52 ft
Specific Energy	1.61 ft
Froude Number	1.217
Flow Type	Supercritical

GVF Input Data

Worksheet for EX A1

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	13.1 in
Critical Depth	14.4 in
Channel Slope	0.022 ft/ft
Critical Slope	0.014 ft/ft

Worksheet for EX C1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.035 ft/ft
Discharge	156.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	2.00
0+50	1.80
0+52	1.00
0+80	1.00
0+85	2.00
0+90	3.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 2.00)	(0+90, 3.00)	0.030

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	8.7 in
Elevation Range	1.0 to 3.0 ft
Flow Area	22.2 ft ²
Wetted Perimeter	33.6 ft
Hydraulic Radius	7.9 in
Top Width	33.42 ft
Normal Depth	8.7 in
Critical Depth	12.5 in
Critical Slope	0.017 ft/ft
Velocity	7.03 ft/s
Velocity Head	0.77 ft
Specific Energy	1.49 ft
Froude Number	1.520
Flow Type	Supercritical

GVF Input Data

Worksheet for EX C1

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.7 in
Critical Depth	12.5 in
Channel Slope	0.035 ft/ft
Critical Slope	0.017 ft/ft

Worksheet for EX C2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.035 ft/ft
Discharge	156.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	91.50
0+20	90.50
0+90	90.50
1+20	91.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 91.50)	(1+20, 91.00)	0.030

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	4.8 in
Elevation Range	90.5 to 91.5 ft
Flow Area	34.6 ft ²
Wetted Perimeter	102.2 ft
Hydraulic Radius	4.1 in
Top Width	102.18 ft
Normal Depth	4.8 in
Critical Depth	5.8 in
Critical Slope	0.018 ft/ft
Velocity	4.50 ft/s
Velocity Head	0.32 ft
Specific Energy	0.72 ft
Froude Number	1.364
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
------------------	--------

Worksheet for EX C2

GVF Input Data	
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.8 in
Critical Depth	5.8 in
Channel Slope	0.035 ft/ft
Critical Slope	0.018 ft/ft

Wash Cross Sections Proposed Condition

Worksheet for PROP A1

Project Description	
Friction Method	Manning
Solve For	Formula Normal Depth
Input Data	
Roughness Coefficient	0.040
Channel Slope	0.040 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	8.00 ft
Discharge	155.00 cfs
Results	
Normal Depth	17.8 in
Flow Area	20.6 ft ²
Wetted Perimeter	20.2 ft
Hydraulic Radius	12.2 in
Top Width	19.84 ft
Critical Depth	20.5 in
Critical Slope	0.023 ft/ft
Velocity	7.53 ft/s
Velocity Head	0.88 ft
Specific Energy	2.36 ft
Froude Number	1.302
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	17.8 in
Critical Depth	20.5 in
Channel Slope	0.040 ft/ft
Critical Slope	0.023 ft/ft

Worksheet for PROP C1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.035 ft/ft
Discharge	156.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	4.00
0+20	4.00
0+20	2.00
0+50	1.80
0+52	1.00
0+80	1.00
0+85	2.00
0+90	3.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 4.00)	(0+90, 3.00)	0.030

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	8.7 in
Elevation Range	1.0 to 4.0 ft
Flow Area	22.2 ft ²
Wetted Perimeter	33.6 ft
Hydraulic Radius	7.9 in
Top Width	33.42 ft
Normal Depth	8.7 in
Critical Depth	12.4 in
Critical Slope	0.016 ft/ft
Velocity	7.03 ft/s
Velocity Head	0.77 ft
Specific Energy	1.49 ft
Froude Number	1.520
Flow Type	Supercritical

Worksheet for PROP C1

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.7 in
Critical Depth	12.4 in
Channel Slope	0.035 ft/ft
Critical Slope	0.016 ft/ft

Worksheet for PROP C2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.035 ft/ft
Discharge	156.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	95.00
0+10	95.00
0+11	91.50
0+20	90.50
0+90	90.50
1+20	91.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 95.00)	(1+20, 91.00)	0.030

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	4.9 in
Elevation Range	90.5 to 95.0 ft
Flow Area	34.1 ft ²
Wetted Perimeter	98.0 ft
Hydraulic Radius	4.2 in
Top Width	97.98 ft
Normal Depth	4.9 in
Critical Depth	5.9 in
Critical Slope	0.018 ft/ft
Velocity	4.58 ft/s
Velocity Head	0.33 ft
Specific Energy	0.73 ft
Froude Number	1.370
Flow Type	Supercritical

Worksheet for PROP C2

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.9 in
Critical Depth	5.9 in
Channel Slope	0.035 ft/ft
Critical Slope	0.018 ft/ft

Appendix D – Army Corp Jurisdiction Delineation



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
3636 N CENTRAL AVENUE, SUITE 900
PHOENIX, AZ 85012-1939

June 26, 2019

SUBJECT: Determination of Need for Department of the Army Permit

Gideon H. Zeidler
Parolo, LLC
7775 E Fledgling Drive
Scottsdale, Arizona 85255

Dear Mr. Zeidler:

I am responding to your request (File No. SPL-2019-00519) dated May 29, 2019, for clarification whether a Department of the Army Permit is required concerning the proposed development of your property, located within 40 acres of land south of Happy Valley Road and west of 92nd Street, in a portion of Section 7, Township 4 North, Range 5 East (33.710817°N, -111.886054°W), City of Scottsdale, Maricopa County, Arizona.

The Corps' evaluation process for determining if you need a permit is based on whether or not the proposed project is located within or contains a water of the United States, and whether or not the proposed project includes an activity potentially regulated under Section 10 of the Rivers and Harbors Act or Section 404 of the Clean Water Act. If both conditions are met, a permit would be required.

Based on the attached dry land approved jurisdictional determination dated June 24, 2019, it appears that your project site (described above) does not contain waters of the United States pursuant to 33 CFR Part 325.9. Although I have determined the proposed project does not require a permit under Section 404 of the Clean Water Act pursuant to 33 CFR Part 323.4, your proposed project may be regulated under other Federal, State, and local laws.

If you have any questions, please contact Ann Palaruan at (602) 230-6955 or via e-mail at Cynthia.A.Palaruan@usace.army.mil. Thank you for participating in the Regulatory Program. Please help me to evaluate and improve the regulatory experience for others by completing the customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Sincerely,

A handwritten signature in blue ink that reads "Sallie Diebolt".

Sallie Diebolt
Chief, Arizona Branch
Regulatory Division

DRY LAND APPROVED JURISDICTIONAL DETERMINATION FORM¹
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 6/24/2019

B. DISTRICT OFFICE AND FILE NUMBER: Los Angeles District, SPL-2019-00519

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Arizona County: Maricopa

Coordinates of site (lat/long in degree decimal format): Lat. 33°710817N, Long. -111.886054W°

Name of nearest waterbody: Cave Creek

- ☒ Check if map/diagram of review area is available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☒ Office (Desk) Determination. Date: 6/24/2019
- ☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **are no** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **are no** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area.

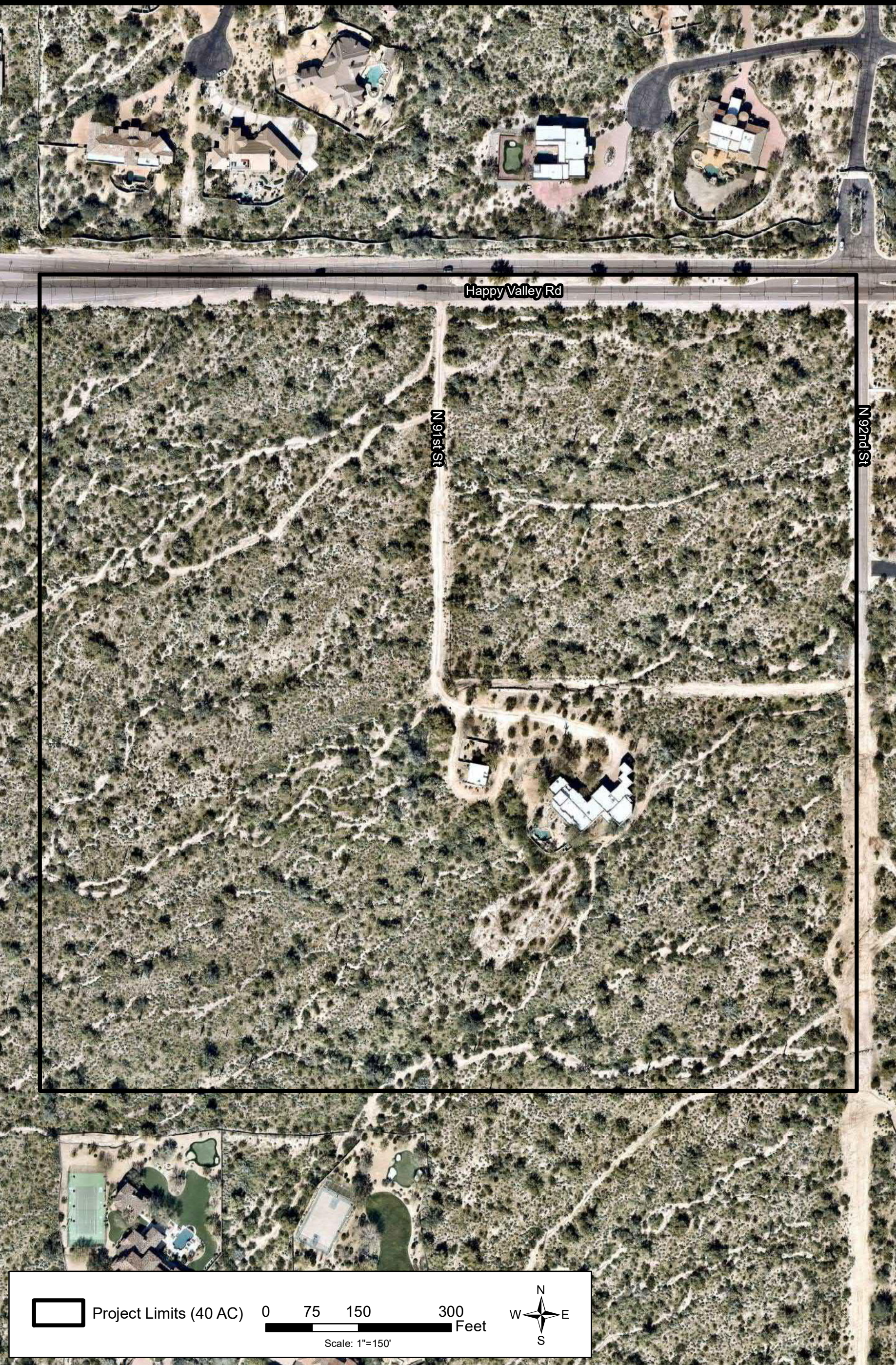
SECTION III: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
Data sheets prepared/submitted by or on behalf of the applicant/consultant.
Office concurs with data sheets/delineation report.
Office does not concur with data sheets/delineation report.
Data sheets prepared by the Corps:
U.S. Geological Survey Hydrologic Atlas:
USGS NHD data.
USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Quad name: Curry's Corner, Ariz.
USDA Natural Resources Conservation Service Soil Survey. Citation: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
National wetlands inventory map(s). Cite name:
State/Local wetland inventory map(s):
FEMA/FIRM maps:
100-year Floodplain Elevation is:
- ☒ Photographs: ☒ Aerial (Name & Date): Goggle Map Imagery, Yr2019
☒ or ☒ (Name & Date): Field Photos: 2/2018
- ☐ Applicable/supporting case law:

B. REQUIRED ADDITIONAL COMMENTS TO SUPPORT JD. EXPLAIN RATIONALE FOR DETERMINATION THAT THE REVIEW AREA ONLY INCLUDES DRY LAND: This property lacks physical indicators of a 404 Ordinary Highwater Mark. No Clean Water Act Section 404 jurisdiction is evident on this property.

¹ This form is for use only in recording approved JDs involving dry land. It extracts the relevant elements of the longer approved JD form in use since 2007 for aquatic areas and adds no new fields.



 Expect More. Experience Better.	HV91	Scottsdale, Maricopa County, Arizona
	Project Aerial	