PRELIMINARY DRAINAGE REPORT

Solitude

Southeast of Happy Valley Road and Pima Road
Scottsdale, Arizona

Prepared for:

Sonora West Development INC.
8937 East Bell Road
Suite 100
Scottsdale, Arizona 85260

Prepared by:

Kimley-Horn and Associates
1001 West Southern Avenue, Suite 131
Mesa, Arizona 85210
291203002
July 2020

PRELIMINARY DRAINAGE REPORT

SOLITUDE

SOUTHEAST OF HAPPY VALLEY ROAD AND PIMA ROAD

SCOTTSDALE, ARIZONA

JULY 2020

Prepared By:

Kimley»Horn

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INTRODUCTION

PROJECT DESCRIPTION

This Preliminary Drainage report has been prepared for the proposed Solitude residential development. Solitude is 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 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).

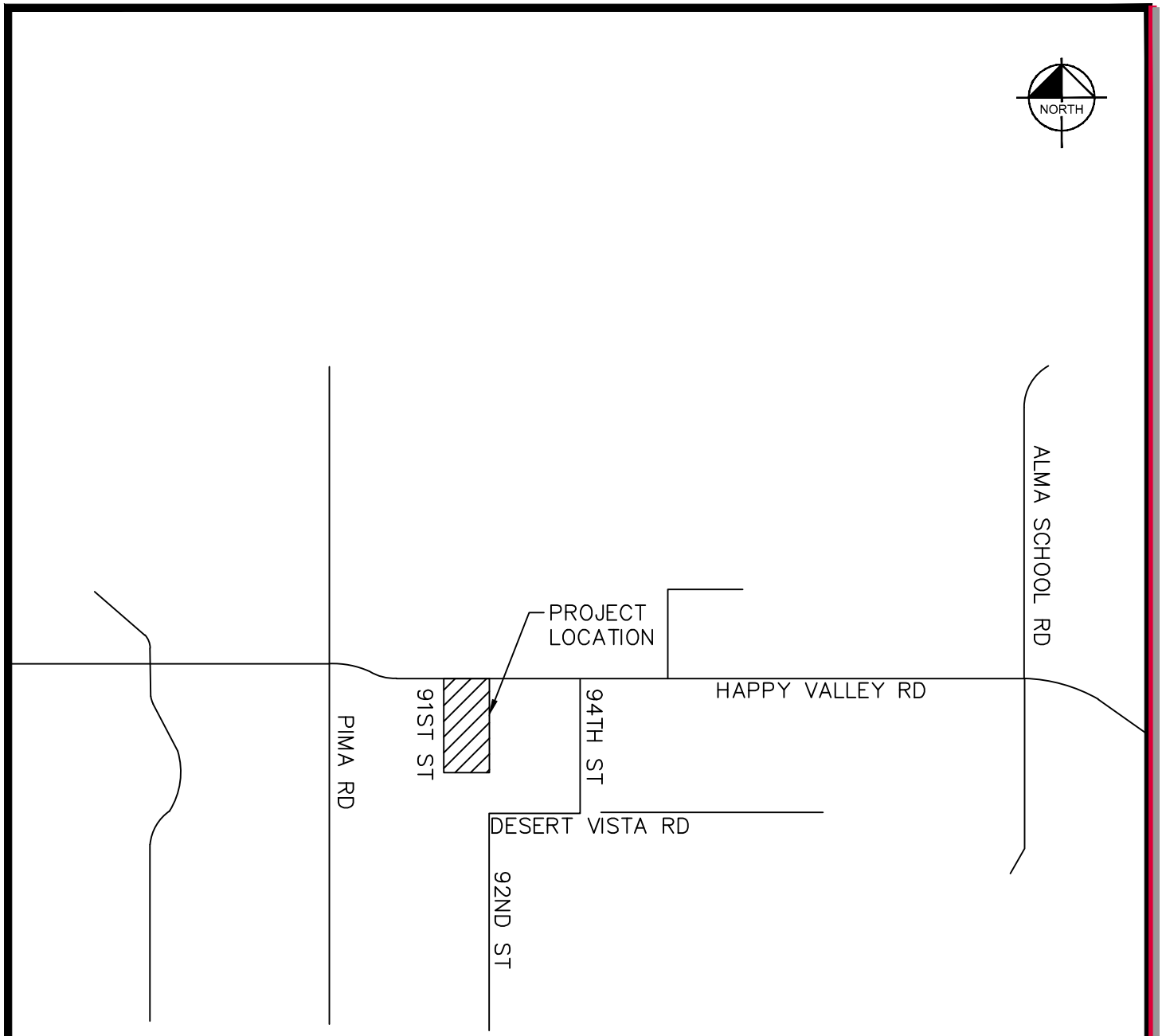

FIGURE 1
VICINITY MAP

Kimley»Horn

K:\EAV_Civil\291203001 - HV92\Reports\WaterBOD\Figures\V-MAP.dwg Sep 24, 2019 dan.recker
XREFS:

3-WM-2020
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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

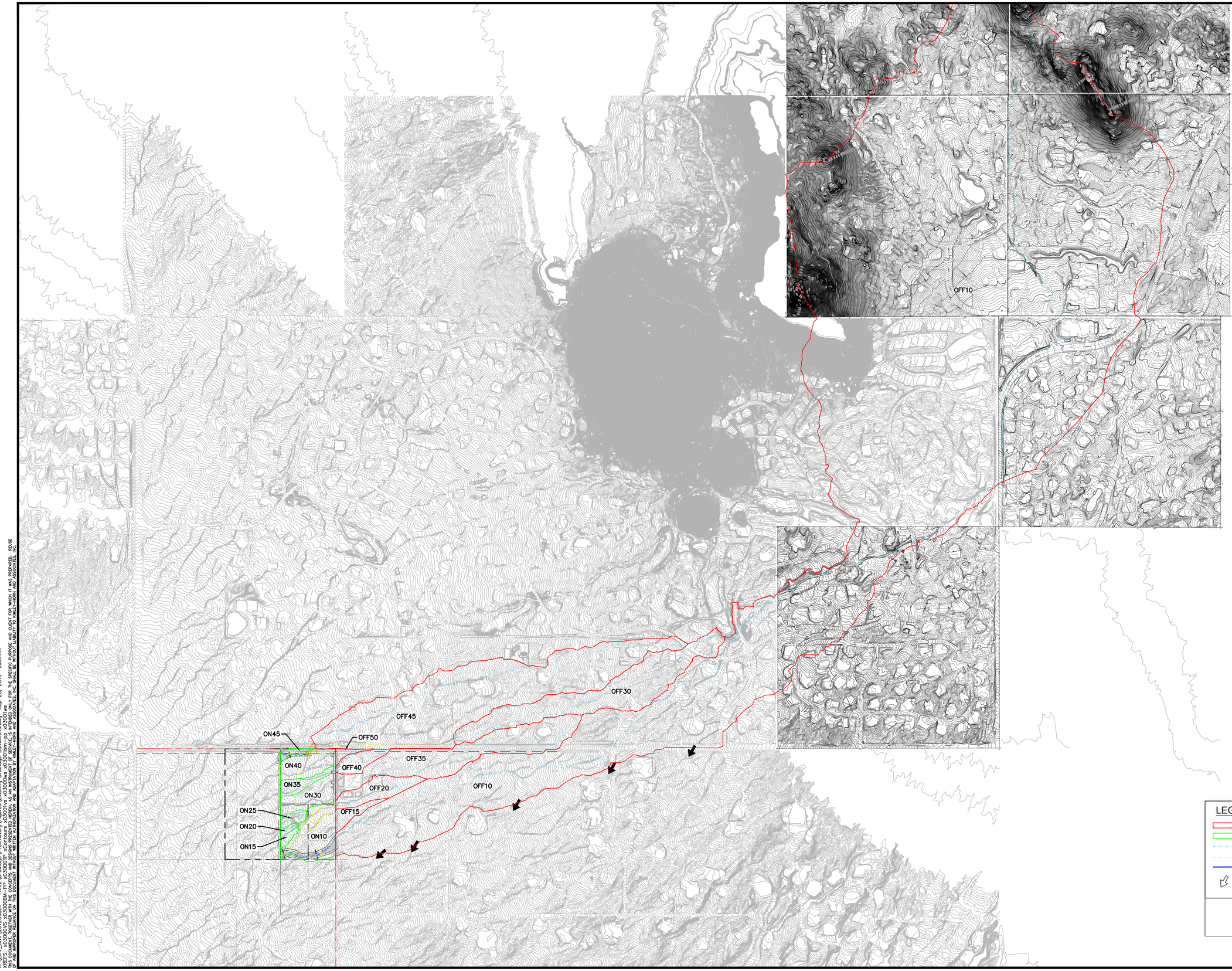
Multiple washes of various sizes and depth cross the site from northeast to southwest. Two of the washes, located at the southeast corner and the north portion of the site, are identified as significant washes with a flow over 50 cfs. Refer to **Figure 3: Existing Drainage Condition**.

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.



NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

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

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

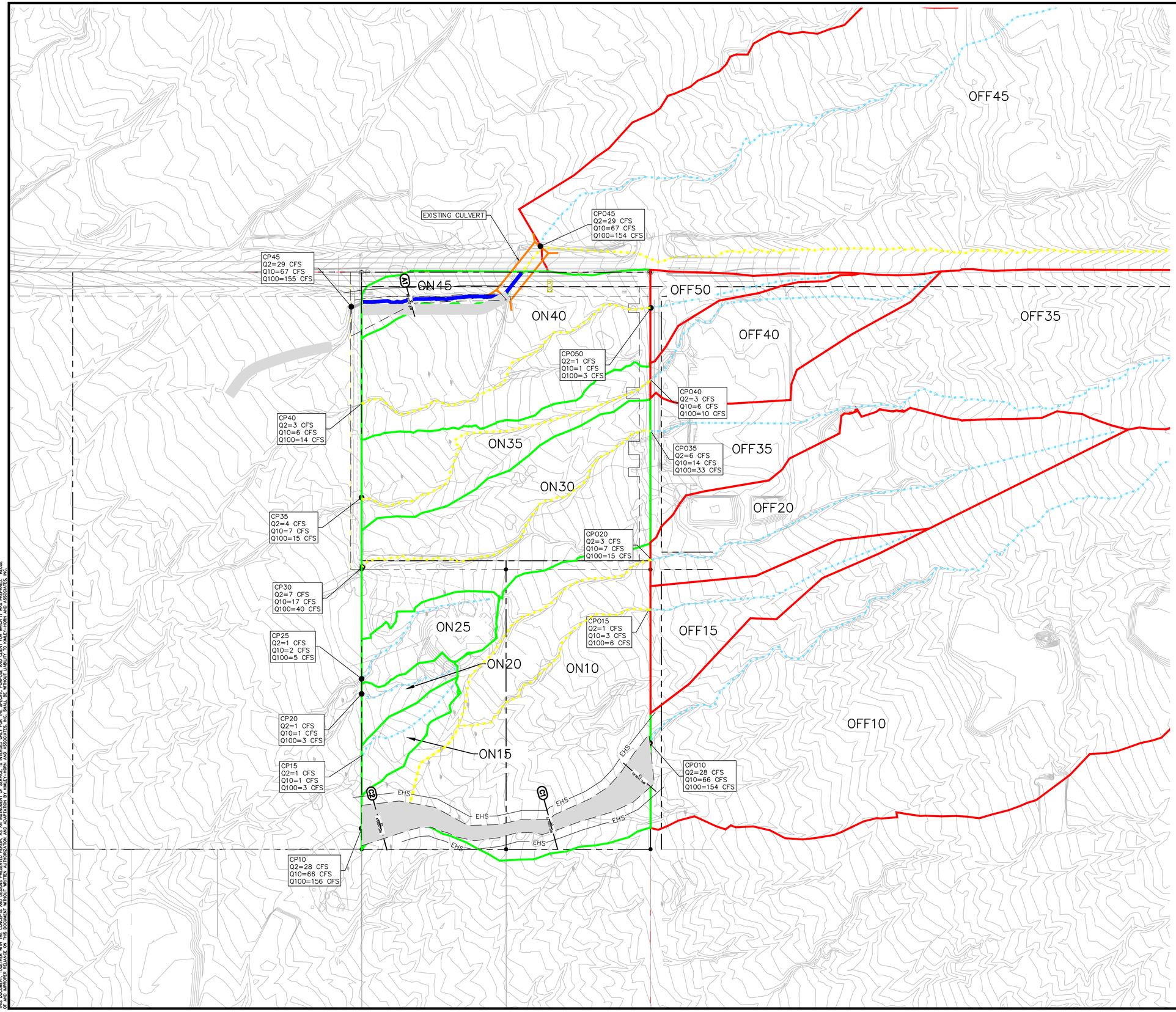
SOLITUDE
FIGURE 2
OFFSITE DRAINAGE MAP
SCOTTSDALE, ARIZONA

PROJECT NO.
291203001

DRAWING NAME

1 OF 1

3-WM-2020
8/28/2020



NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

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

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

SOLITUDE
FIGURE 3
EXISTING DRAINAGE CONDITION
SCOTTSDALE, ARIZONA

PROJECT NO.
291203001

DRAWING NAME

1 OF 1

3-WM-2020
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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 though 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 ths 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 REQUIEMENTS

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.

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

OFF45

EXISTING CULVERT

CP045
Q2=29 CFS
Q10=67 CFS
Q100=154 CFS

CP050
Q2=1 CFS
Q10=1 CFS
Q100=3 CFS

CP45
Q2=29(29) CFS
Q10=68(67) CFS
Q100=158(155) CFS

CHANNEL A

CULVERT A

OFF50

OFF35

OFF40

ON45

ON28

ON40

CP040
Q2=3 CFS
Q10=6 CFS
Q100=10 CFS

CP40
Q2=2(3) CFS
Q10=4(6) CFS
Q100=7(14) CFS

CULVERT B

OFF35

CP035
Q2=6 CFS
Q10=14 CFS
Q100=33 CFS

ON35

ON27

CP35
Q2=4(4) CFS
Q10=8(7) CFS
Q100=14(15) CFS

CHANNEL C

CULVERT C

OFF20

CP020
Q2=3 CFS
Q10=7 CFS
Q100=15 CFS

CP30
Q2=8(7) CFS
Q10=18(17) CFS
Q100=39(40) CFS

ON30

ON26

ON25

CP25
Q2=1(1) CFS
Q10=1(2) CFS
Q100=3(5) CFS

OFF15

CP015
Q2=1 CFS
Q10=3 CFS
Q100=6 CFS

ON20

CP20
Q2=1(1) CFS
Q10=1(1) CFS
Q100=2(3) CFS

OFF10

ON11

CP15
Q2=1(1) CFS
Q10=1(1) CFS
Q100=2(3) CFS

ON15

CP010
Q2=28 CFS
Q10=66 CFS
Q100=154 CFS

ON10

CP10
Q2=30(30) CFS
Q10=72(72) CFS
Q100=168(172) CFS

LEGEND

- OFFSITE SUBBASIN BOUNDARY
- ONSITE SUBBASIN BOUNDARY
- FLOWPATH
- ROUTING REACH
- SIGNIFICANT WASH (>50 CFS)

CP01
Q2=0(0) CFS
Q10=1(1) CFS
Q100=2(3) CFS
CONCENTRATION POINT & PEAK FLOW SUMMARY PROD COND (EX COND)

A2 SITE CROSS SECTION LOCATION

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

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

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

SOLITUDE
FIGURE 4
PROPOSED DRAINAGE CONDITION
SCOTTSDALE, ARIZONA

PROJECT NO.
291203001

DRAWING NAME

1 OF 1

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8/28/2020

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 NMIN parameter selected for the HEC-1 Model. Because of the varying sub-basin sizes, the selected NMIN 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 NMIN 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.

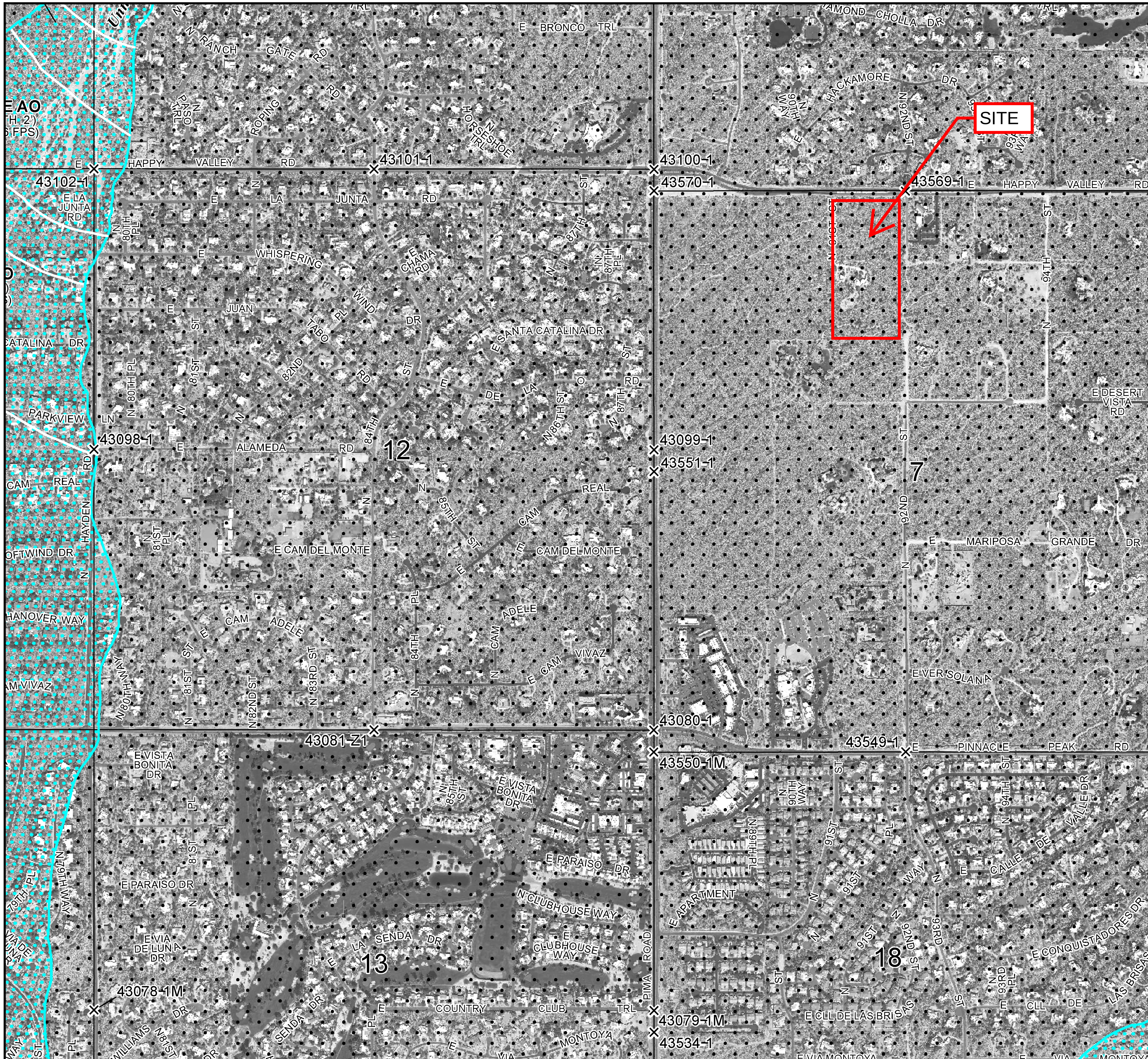
Federal Emergency Management Agency, Flood Insurance Rate Map Panel No04013C1331M, dated November 4, 2015

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



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

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

3-WM-2020
8/28/2020

Appendix B – Hydrology

HEC-1 Exhibits (Existing and Proposed Conditions)

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

DDSMW Output: (Existing and Proposed Conditions)

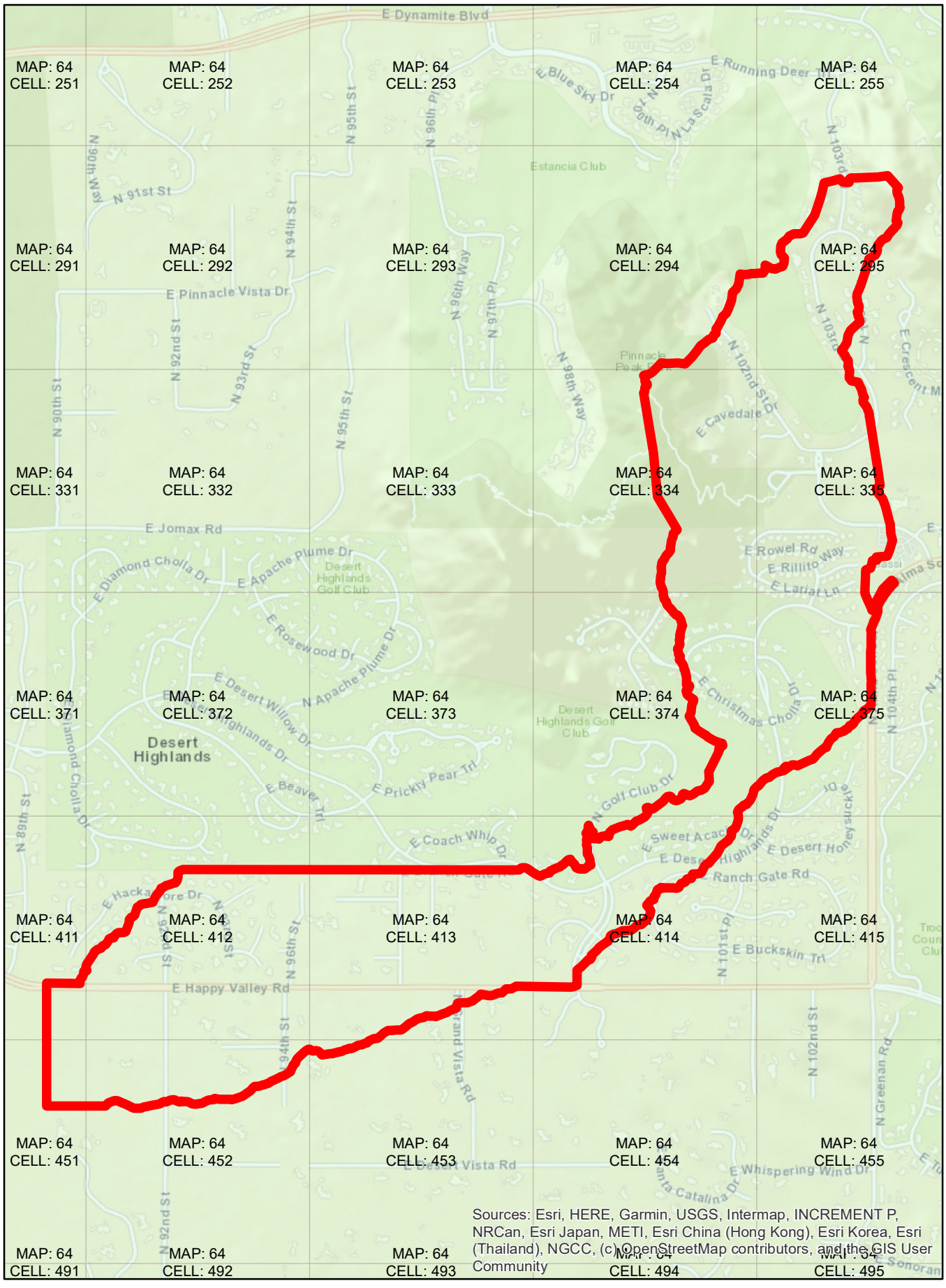
- Rainfall
- Land use
- Soils
- Storage
- Routing

HEC-1 Output

- Existing Condition
- Proposed Condition

Existing Condition

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



3-WM-2020
8/28/2020

Area ID	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
	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
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)

Area ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	Rainfall Losses: IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period Parameters: 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

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

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

3-WM-2020
8/28/2020

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

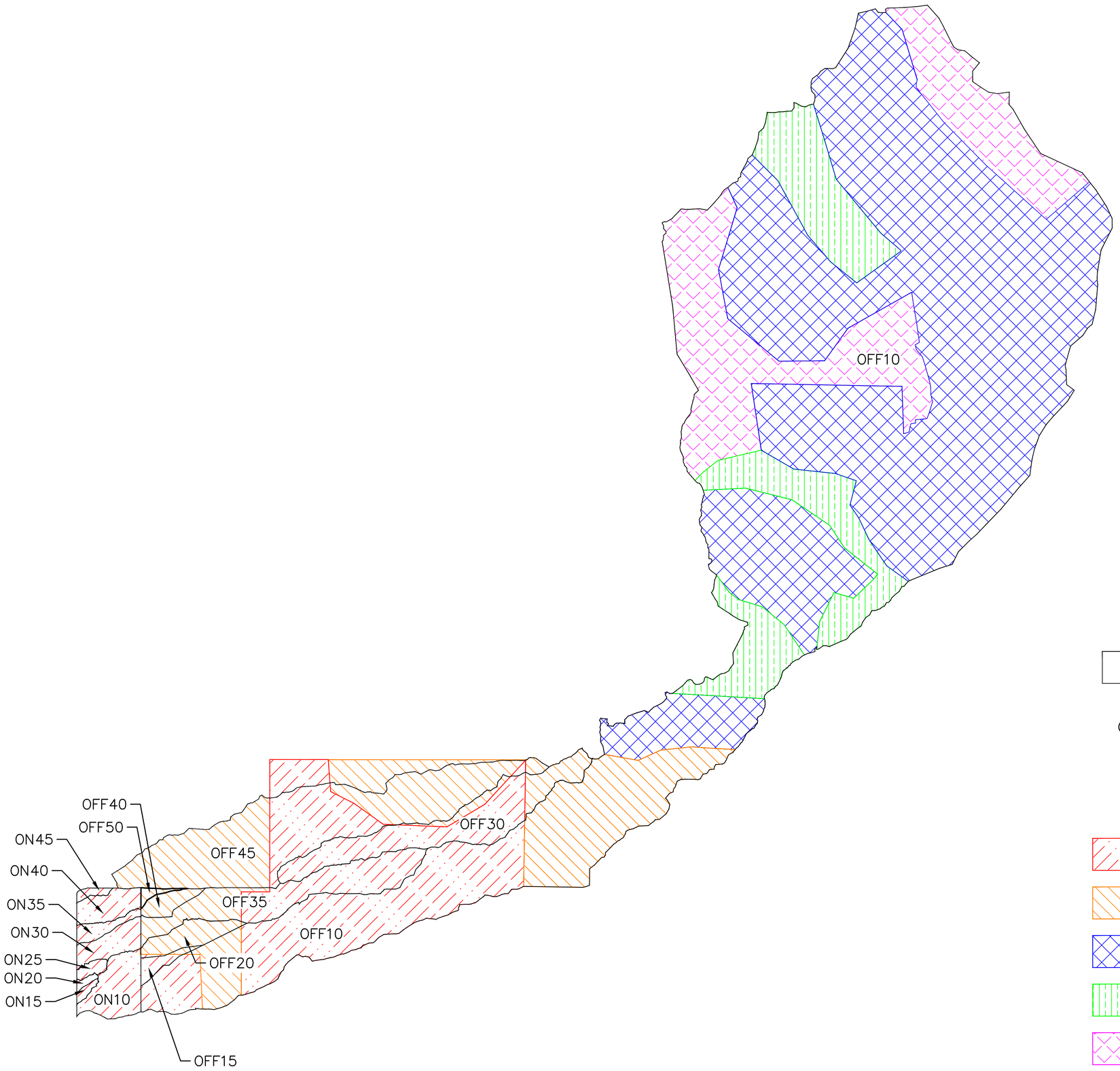
Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
OFF10	DESERT	0.0740	8.2	0.15	0	25.0	DRY	0.042	Desert
	GOLF	0.1020	11.3	0.44	0	60.0	NORMAL	0.023	Golf Course
	R1-18	0.5110	56.8	0.30	27	50.0	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)

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



NO.	REVISION	BY	DATE	APPR.

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

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

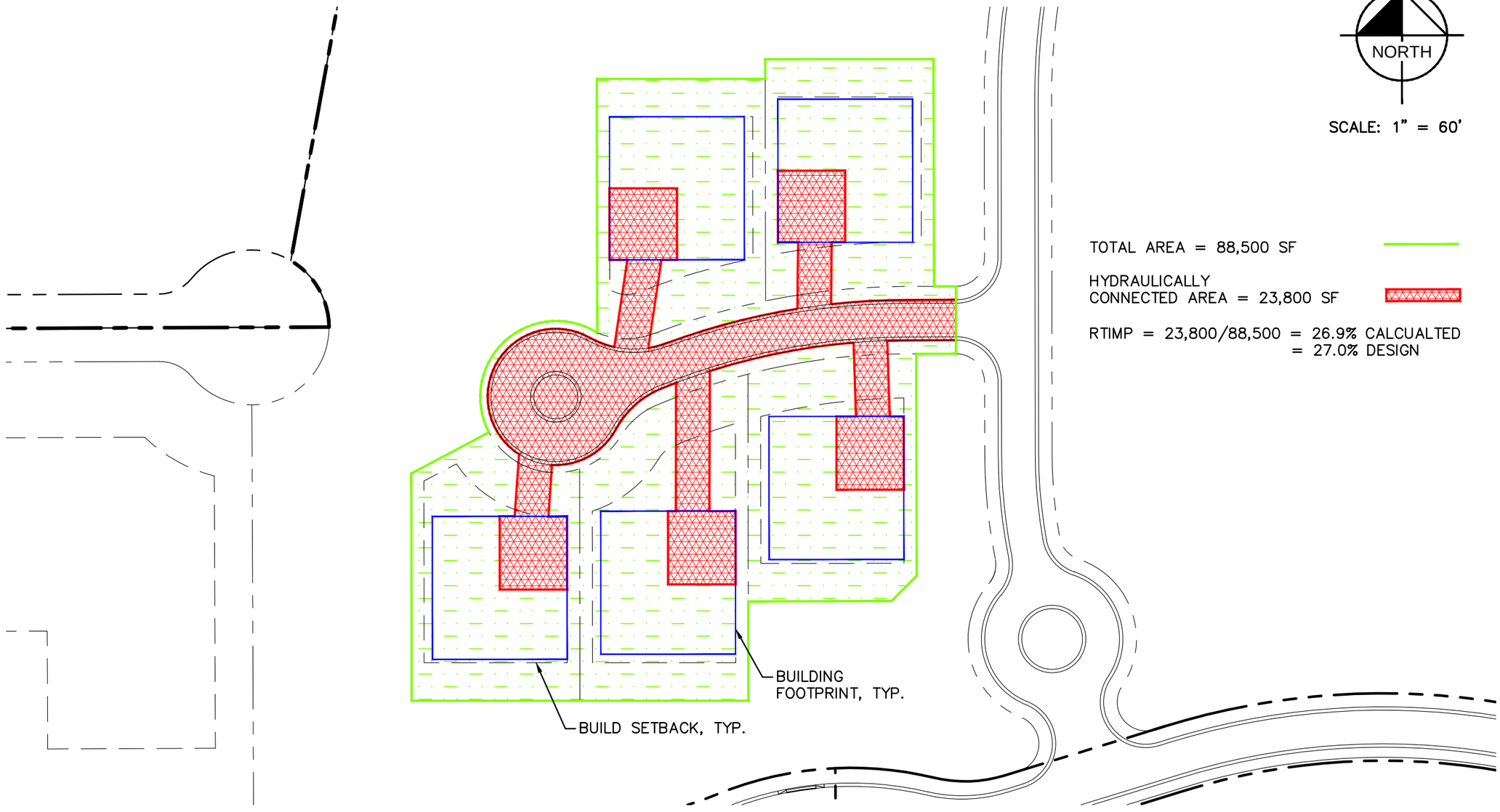
SOLITUDE
EXISTING CONDITION HEC 1 - LAND USE MAP
SCOTTSDALE, ARIZONA

PROJECT NO.
291203001

DRAWING NAME

1 OF 1

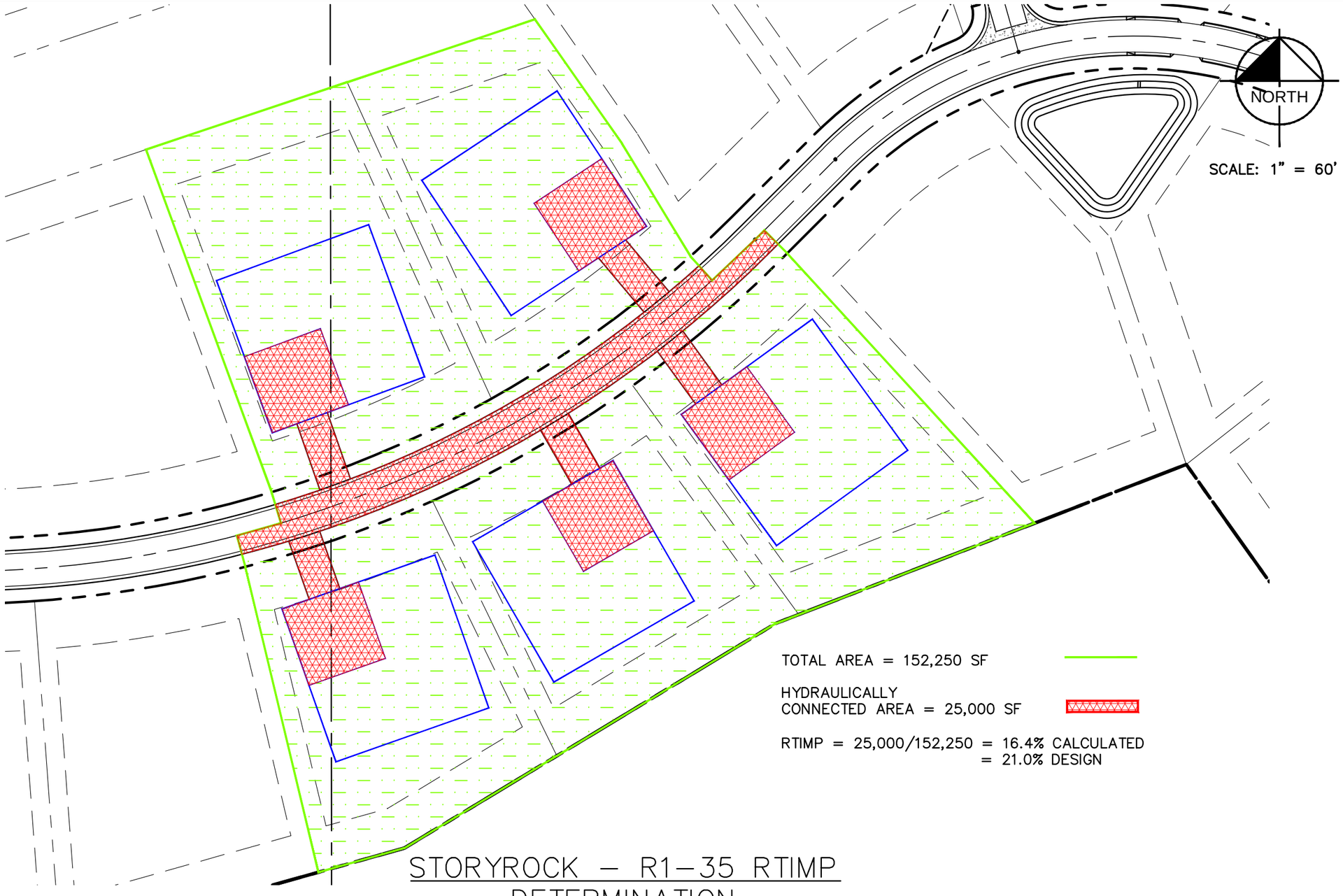
3-WM-2020
8/28/2020



STORYROCK – R1–18 RTIMP DETERMINATION

Kimley»Horn

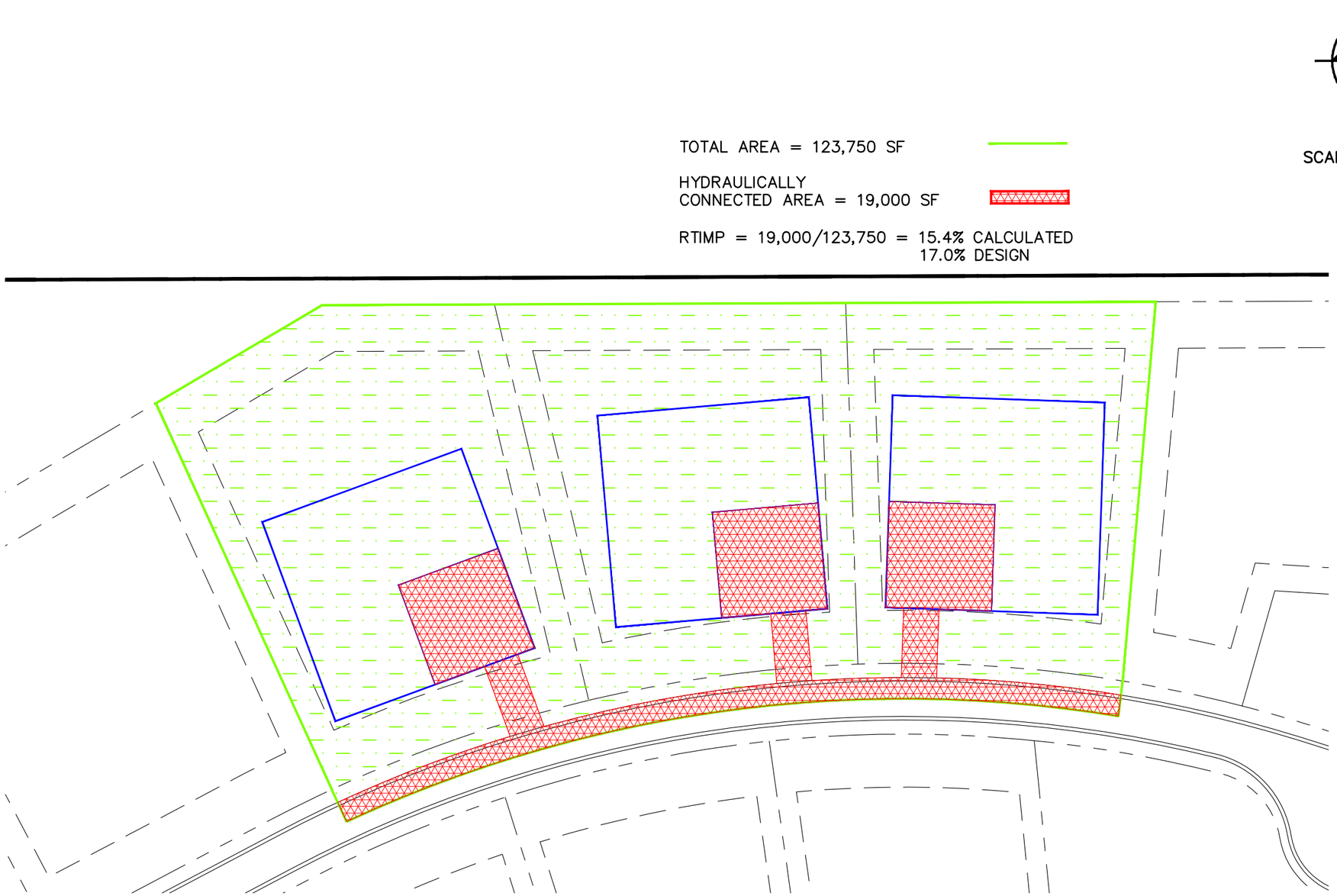
3-WM-2020
8/28/2020



STORYROCK – R1–35 RTIMP DETERMINATION

Kimley»Horn

3-WM-2020
8/28/2020

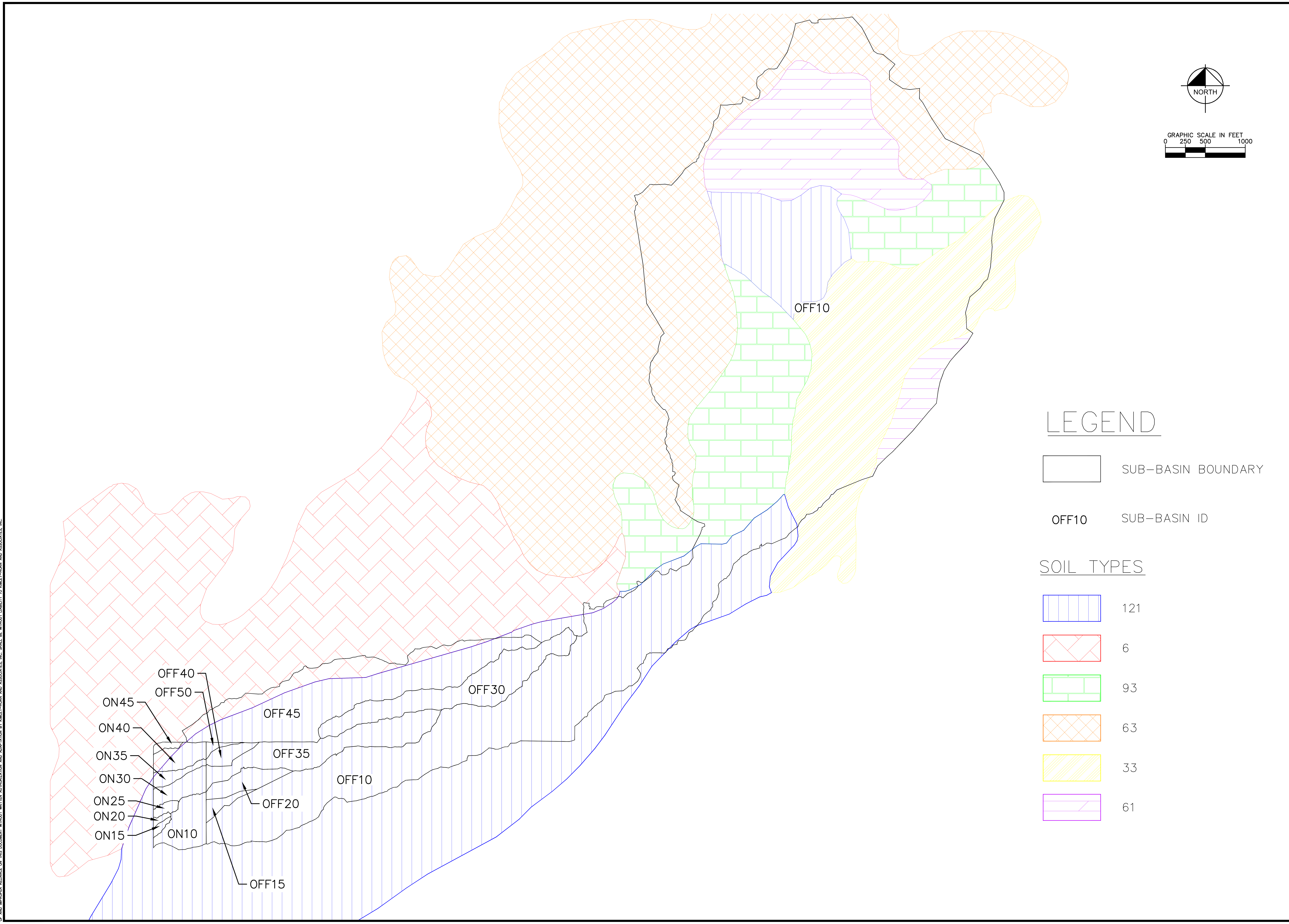


STORYROCK – R1–43 RTIMP DETERMINATION

Kimley»Horn

3-WM-2020
8/28/2020

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	0.011	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	



SOLITUDE
EXISTING CONDITION
HEC 1 - SOILS MAP
SCOTTSDALE, ARIZONA

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

Kimley-Horn

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

NO. | REVISION | BY | DATE | APPR.

PROJECT NO.
291203001
DRAWING NAME

1 OF 1

3-WM-2020
8/28/2020

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

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

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

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1*****************************************                    *********************************
 *                                       *                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                    *    U.S. ARMY CORPS OF ENGINEER
 *              JUN   1998               *                    *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1                *                    *          609 SECOND STREET
 *                                       *                    *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:49:42   *                    *           (916) 756-1104
 *                                       *                    *
 *****************************************                    *********************************

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                                X     X  X        X               X
                                XXXXXXX  XXXX     X        XXXXX  X
                                X     X  X        X               X
                                X     X  X        X     X         X
                                X     X  XXXXXXX   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        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
```

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             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
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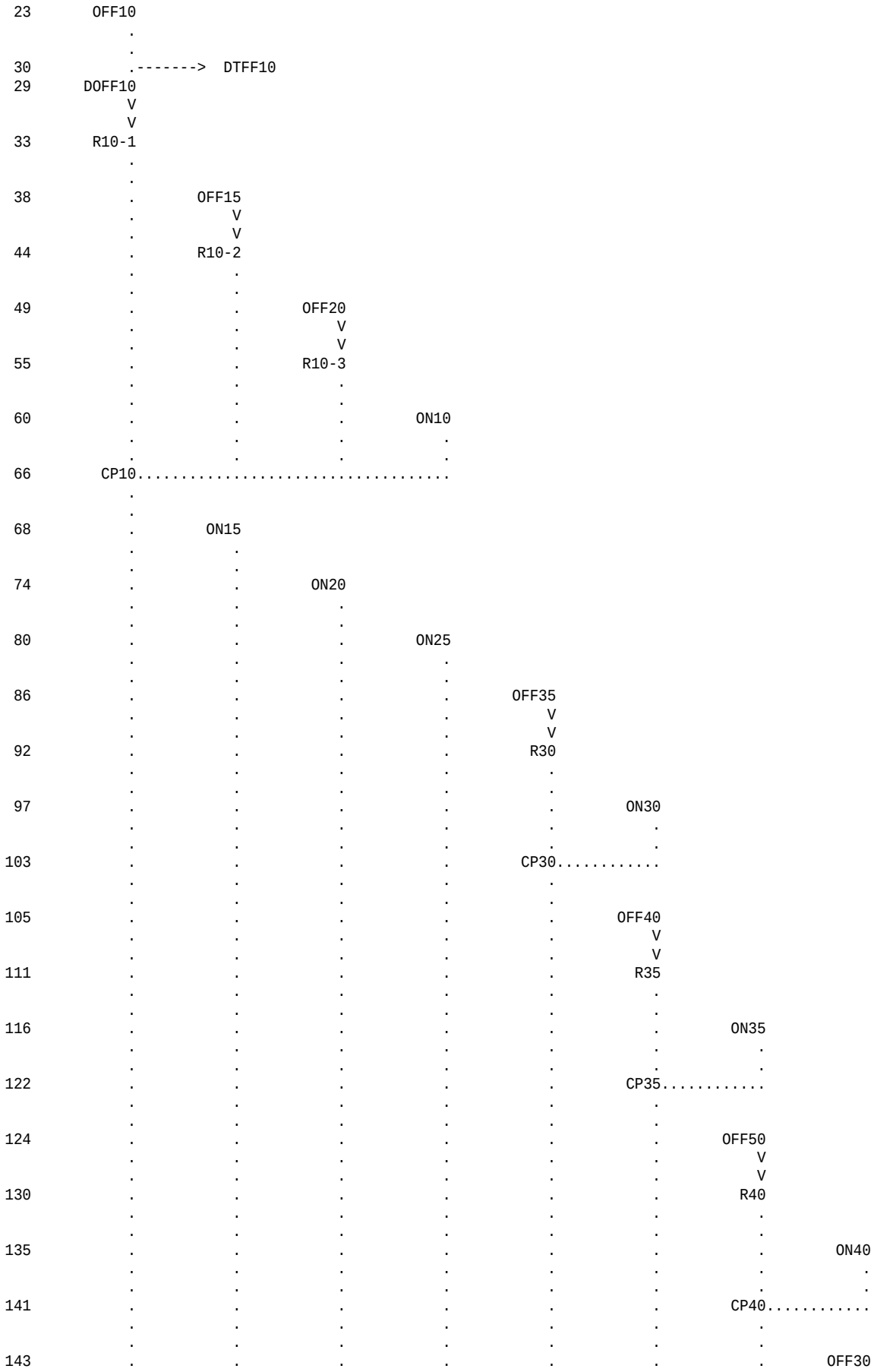
```
 80          KK    ON25   BASIN
 81          BA   0.002
 82          LG    0.15    0.37    6.54    0.14       0
 83          UC   0.174   0.219
 84          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 85          UA     100
             *

 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
             *
```



```
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    RO45   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   CPO45 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 DOFF10
33 R10-1
38 OFF15
44 R10-2
49 OFF20
55 R10-3
60 ON10
66 CP10
68 ON15
74 ON20
80 ON25
86 OFF35
92 R30
97 ON30
103 CP30
105 OFF40
111 R35
116 ON35
122 CP35
124 OFF50
130 R40
135 ON40
141 CP40
143 OFF30

```
                .          .          .          .          .          .          .          V
                .          .          .          .          .          .          .          V
   149          .          .          .          .          .          .          .       RO45
                .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .
   154          .          .          .          .          .          .          .          .       OFF45
                .          .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .          .
   160          .          .          .          .          .          .          .          .     CPO45.....
                .          .          .          .          .          .          .          V
                .          .          .          .          .          .          .          V
   162          .          .          .          .          .          .          .        R45
                .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .
   167          .          .          .          .          .          .          .          .       ON45
                .          .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .          .
   173          .          .          .          .          .          .          .          .     CP45.....

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                  ********************************
 *                                      *                                 *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                 *    U.S. ARMY CORPS OF ENGINEER
 *               JUN   1998             *                                 *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1               *                                 *         609 SECOND STREET
 *                                      *                                 *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:49:42  *                                 *          (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
```

```
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .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       .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

   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       .01       .01       .01
                        .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        1.31  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

                                       PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
          OPERATION       STATION      FLOW     PEAK                                            AREA      STAGE     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
	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						
+		RO45	7.	4.60	2.	0.	0.	.04
	HYDROGRAPH AT						
+		OFF45	25.	4.30	4.	1.	0.	.08
	2 COMBINED AT						
+		CPO45	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 ***

```
1*****************************************                    *********************************
 *                                       *                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                    *    U.S. ARMY CORPS OF ENGINEER
 *              JUN   1998               *                    *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1                *                    *          609 SECOND STREET
 *                                       *                    *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:49:59   *                    *           (916) 756-1104
 *                                       *                    *
 *****************************************                    *********************************

                                X     X  XXXXXXX   XXXXX          X
                                X     X  X        X     X         XX
                                X     X  X        X               X
                                XXXXXXX  XXXX     X        XXXXX  X
                                X     X  X        X               X
                                X     X  X        X     X         X
                                X     X  XXXXXXX   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        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
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```
 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
             *
```



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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
             *
```
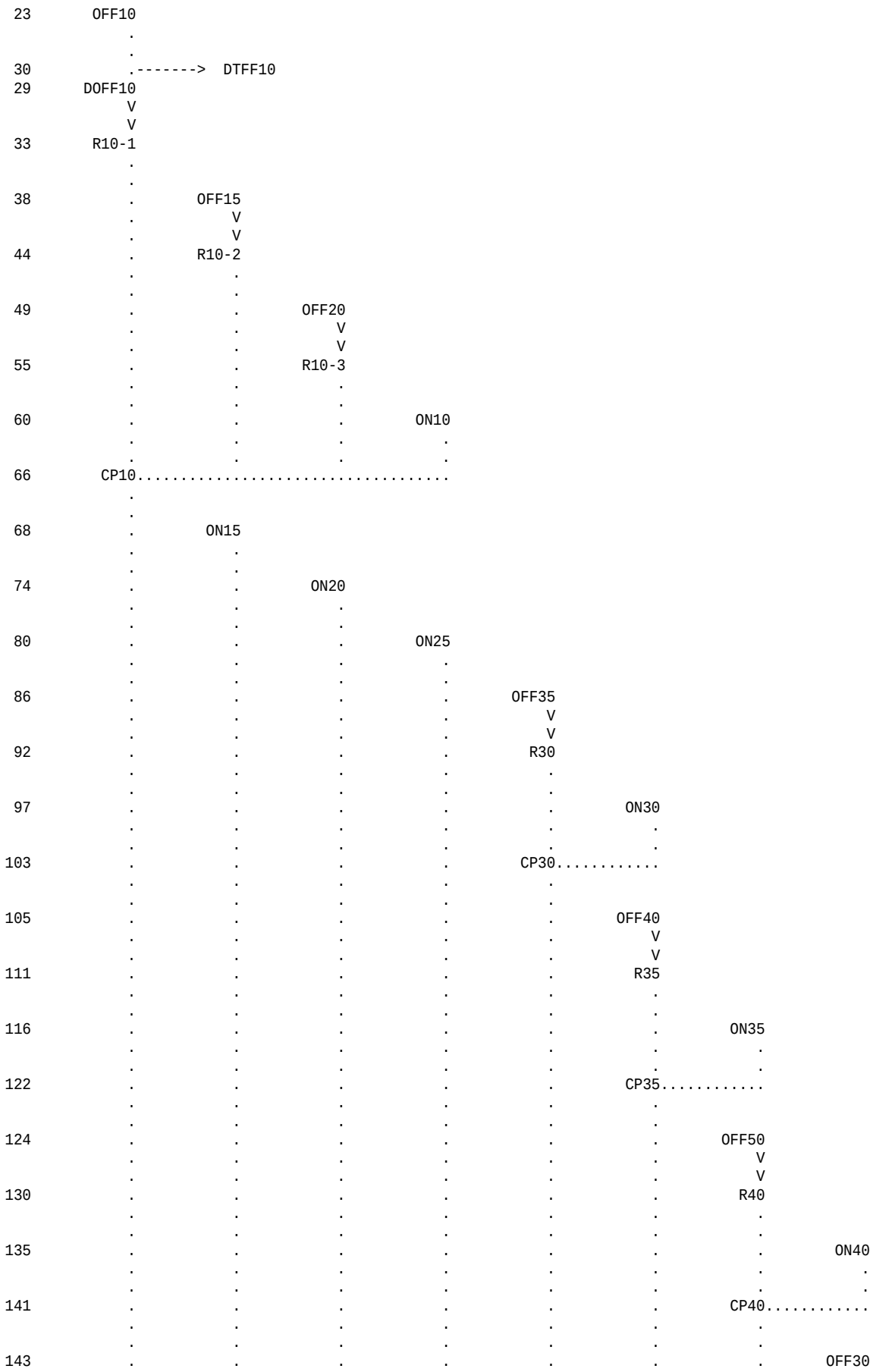

```
            130           KK     R40   ROUTE
            131           RS       1    FLOW
            132           RC   0.045   0.045   0.045     780  0.0250    0.00
            133           RX    0.00   30.00   48.00   52.00   58.00   60.00   70.00   80.00
            134           RY   10.10   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    RO45   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   CPO45 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 DOFF10
33 R10-1
38 OFF15
44 R10-2
49 OFF20
55 R10-3
60 ON10
66 CP10
68 ON15
74 ON20
80 ON25
86 OFF35
92 R30
97 ON30
103 CP30
105 OFF40
111 R35
116 ON35
122 CP35
124 OFF50
130 R40
135 ON40
141 CP40
143 OFF30

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                .          .          .          .          .          .          .          V
                .          .          .          .          .          .          .          V
   149          .          .          .          .          .          .          .       RO45
                .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .
   154          .          .          .          .          .          .          .          .       OFF45
                .          .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .          .
   160          .          .          .          .          .          .          .          .     CPO45.....
                .          .          .          .          .          .          .          V
                .          .          .          .          .          .          .          V
   162          .          .          .          .          .          .          .       R45
                .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .
   167          .          .          .          .          .          .          .          .       ON45
                .          .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .          .
   173          .          .          .          .          .          .          .          .     CP45.....

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                  ********************************
 *                                      *                                 *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                 *    U.S. ARMY CORPS OF ENGINEER
 *               JUN   1998             *                                 *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1               *                                 *         609 SECOND STREET
 *                                      *                                 *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:49:59  *                                 *          (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       .01       .01       .01
                     .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

   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       .01       .01       .01
                     .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

   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

                                       PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
          OPERATION       STATION      FLOW     PEAK                                           AREA      STAGE     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
	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						
+	RO45	17.	4.50	3.	1.	0.	.04
	HYDROGRAPH AT						
+	OFF45	55.	4.27	8.	2.	1.	.08
	2 COMBINED AT						
+	CPO45	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 ***

```
1*****************************************                    *********************************
 *                                       *                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                    *    U.S. ARMY CORPS OF ENGINEER
 *              JUN   1998               *                    *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1                *                    *          609 SECOND STREET
 *                                       *                    *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:50:17   *                    *           (916) 756-1104
 *                                       *                    *
 *****************************************                    *********************************

                                X     X  XXXXXXX   XXXXX          X
                                X     X  X        X     X         XX
                                X     X  X        X               X
                                XXXXXXX  XXXX     X        XXXXX  X
                                X     X  X        X               X
                                X     X  X        X     X         X
                                X     X  XXXXXXX   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        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
```

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            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
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```
 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
             *
```



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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
             *
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```
            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    RO45   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
                         *

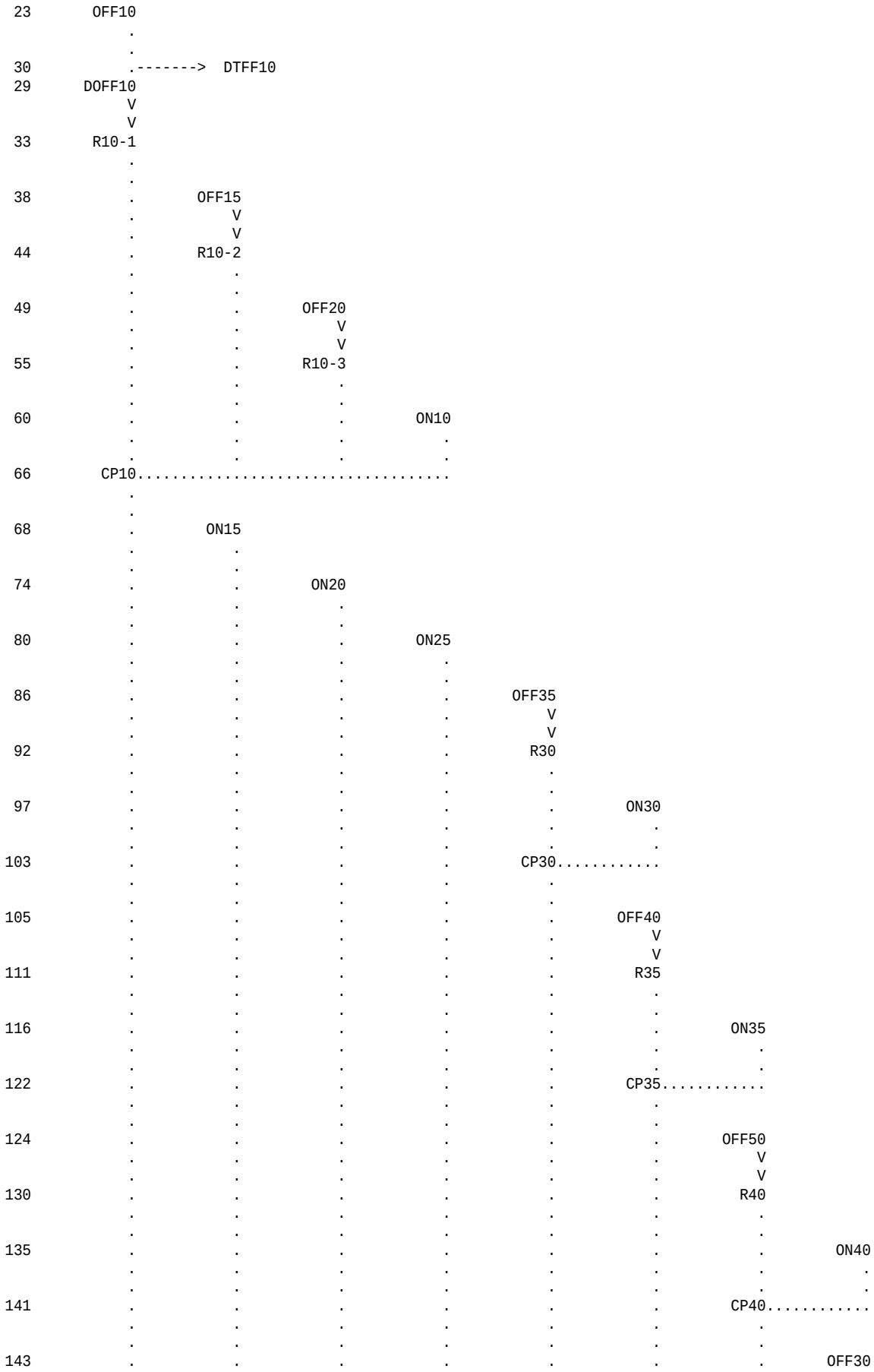
            160          KK   CPO45 COMBINE
            161          HC       2
                         *

            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 DOFF10
33 R10-1
38 OFF15
44 R10-2
49 OFF20
55 R10-3
60 ON10
66 CP10
68 ON15
74 ON20
80 ON25
86 OFF35
92 R30
97 ON30
103 CP30
105 OFF40
111 R35
116 ON35
122 CP35
124 OFF50
130 R40
135 ON40
141 CP40
143 OFF30

```
                .          .          .          .          .          .          .          V
                .          .          .          .          .          .          .          V
   149          .          .          .          .          .          .          .       RO45
                .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .
   154          .          .          .          .          .          .          .          .       OFF45
                .          .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .          .
   160          .          .          .          .          .          .          .          .     CPO45.....
                .          .          .          .          .          .          .          V
                .          .          .          .          .          .          .          V
   162          .          .          .          .          .          .          .        R45
                .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .
   167          .          .          .          .          .          .          .          .       ON45
                .          .          .          .          .          .          .          .          .
                .          .          .          .          .          .          .          .          .
   173          .          .          .          .          .          .          .          .     CP45.....

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                  ********************************
 *                                      *                                 *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                 *    U.S. ARMY CORPS OF ENGINEER
 *               JUN   1998             *                                 *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1               *                                 *         609 SECOND STREET
 *                                      *                                 *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:50:17  *                                 *          (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
```

```
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .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       .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

   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
                      .00       .00       .00       .00       .00       .00       .00       .01       .01       .01
                      .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

   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
                      .00       .00       .00       .00       .00       .00       .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

                                          PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
          OPERATION       STATION         FLOW     PEAK                                           AREA      STAGE     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						
+	DOFF10	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						
+	RO45	39.	4.37	7.	2.	1.	.04
	HYDROGRAPH AT						
+	OFF45	124.	4.20	15.	4.	1.	.08
	2 COMBINED AT						
+	CPO45	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

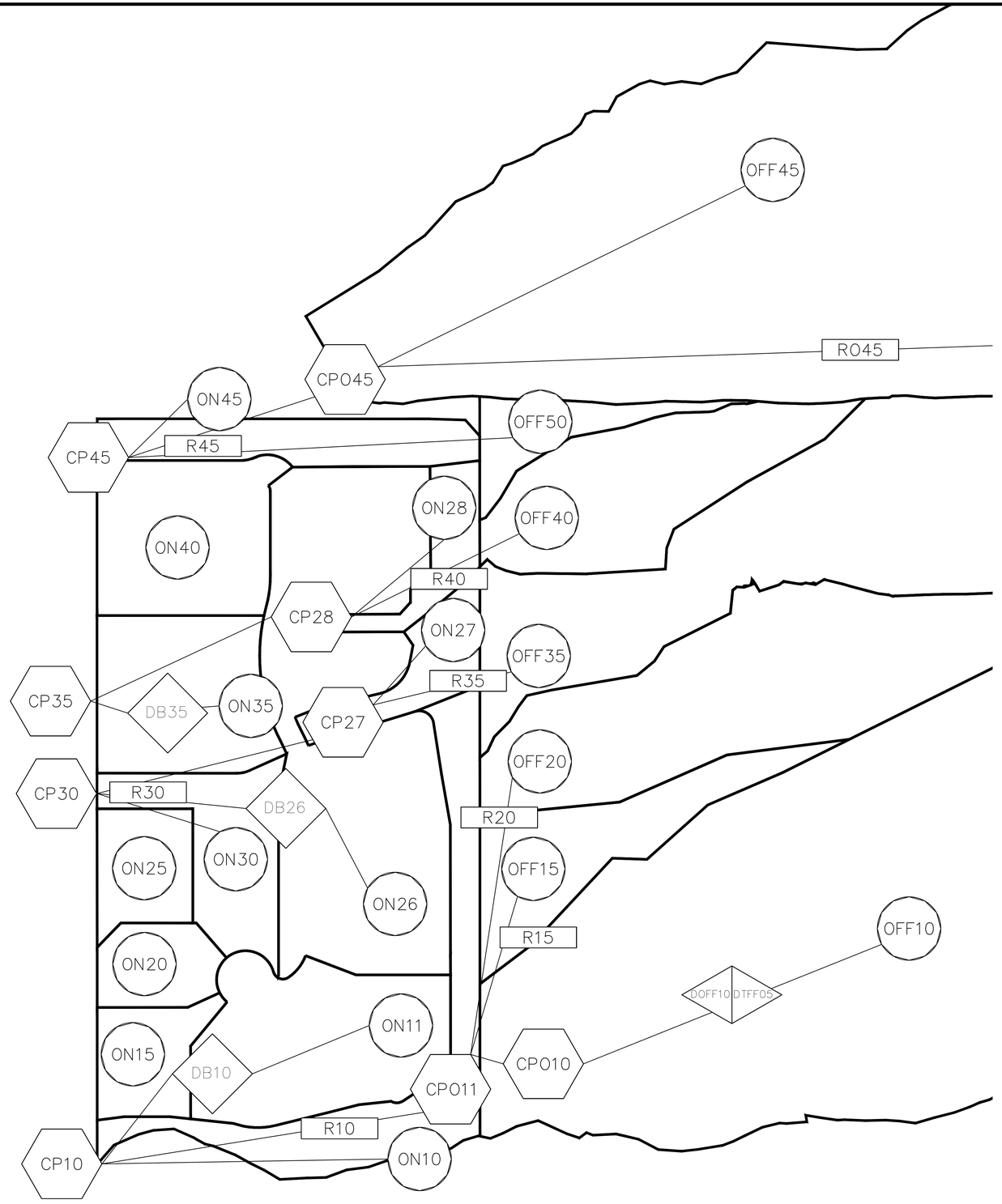
Area ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
Major Basin ID: 01																		
OFF10	0.900	3.21	245.5	237.0	Natural	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

Area ID	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
	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
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

Area ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	Rainfall Losses: IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period Parameters: 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



NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

OFF-SITE
SEE EXISTING
CONDITION
HEC-1 MAP

LEGEND

- SUB-BASIN BOUNDARY
- OFF10 — HEC-1 SUB-BASIN ID
- RCF5 — HEC-1 ROUTE ID
- DVCF3C DR3C — HEC-1 DIVERSION
- CCF4B — HEC-1 CONCENTRATION POINT
- DB20 — HEC-1 STORAGE

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

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

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

SOLITUDE
PROPOSED CONDITION
HEC-1 MAP
SCOTTSDALE, ARIZONA

PROJECT NO.
291203001

DRAWING NAME

1 OF 1

3-WM-2020
8/28/2020

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

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

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

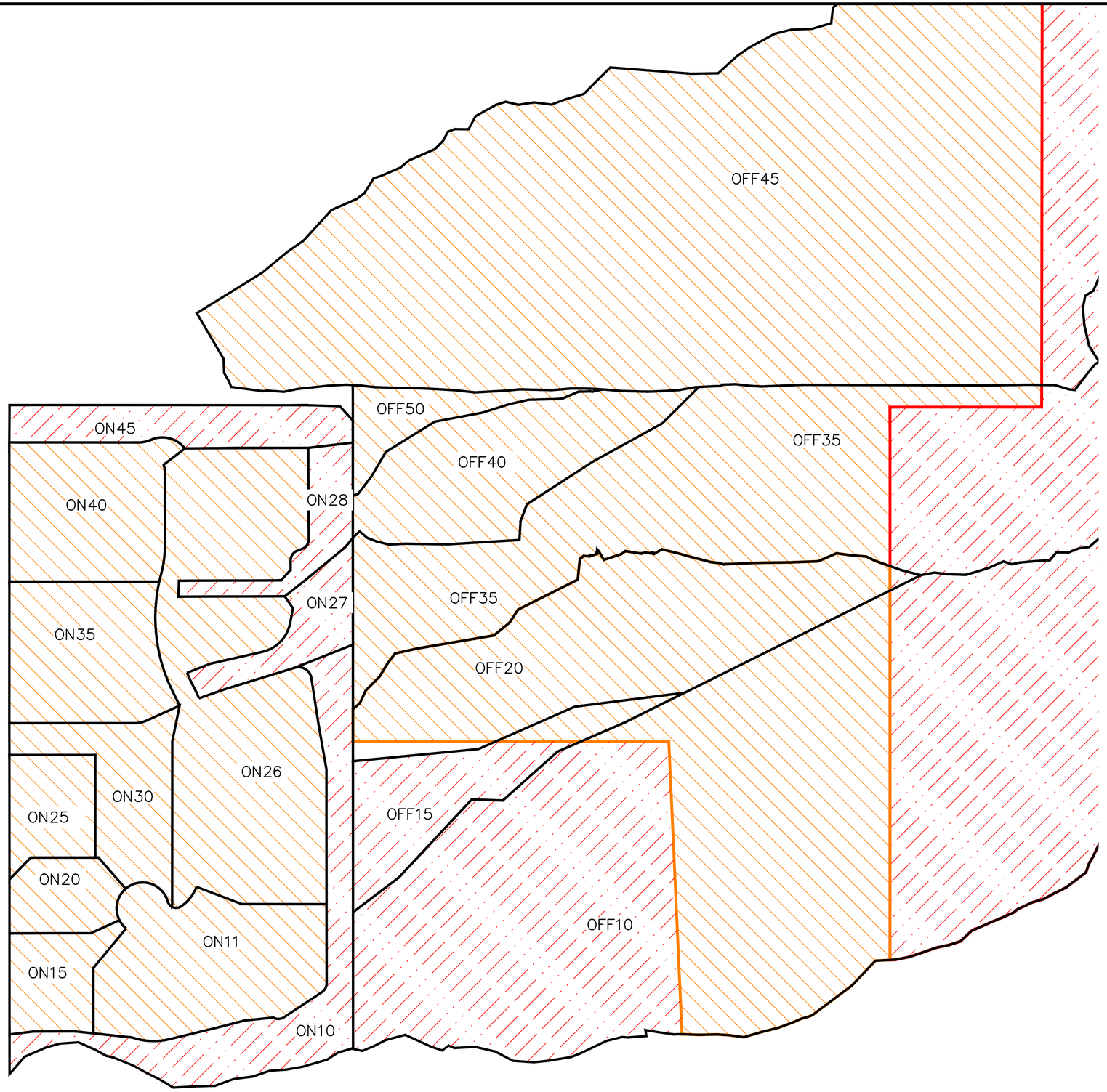
Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0810	**100.0**						
OFF50	R1-43	0.0010	100.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0010	**100.0**						
ON10	DESERT	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

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

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



OFF-SITE
SEE EXISTING
CONDITION
LAND USE MAP

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

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

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

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

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

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

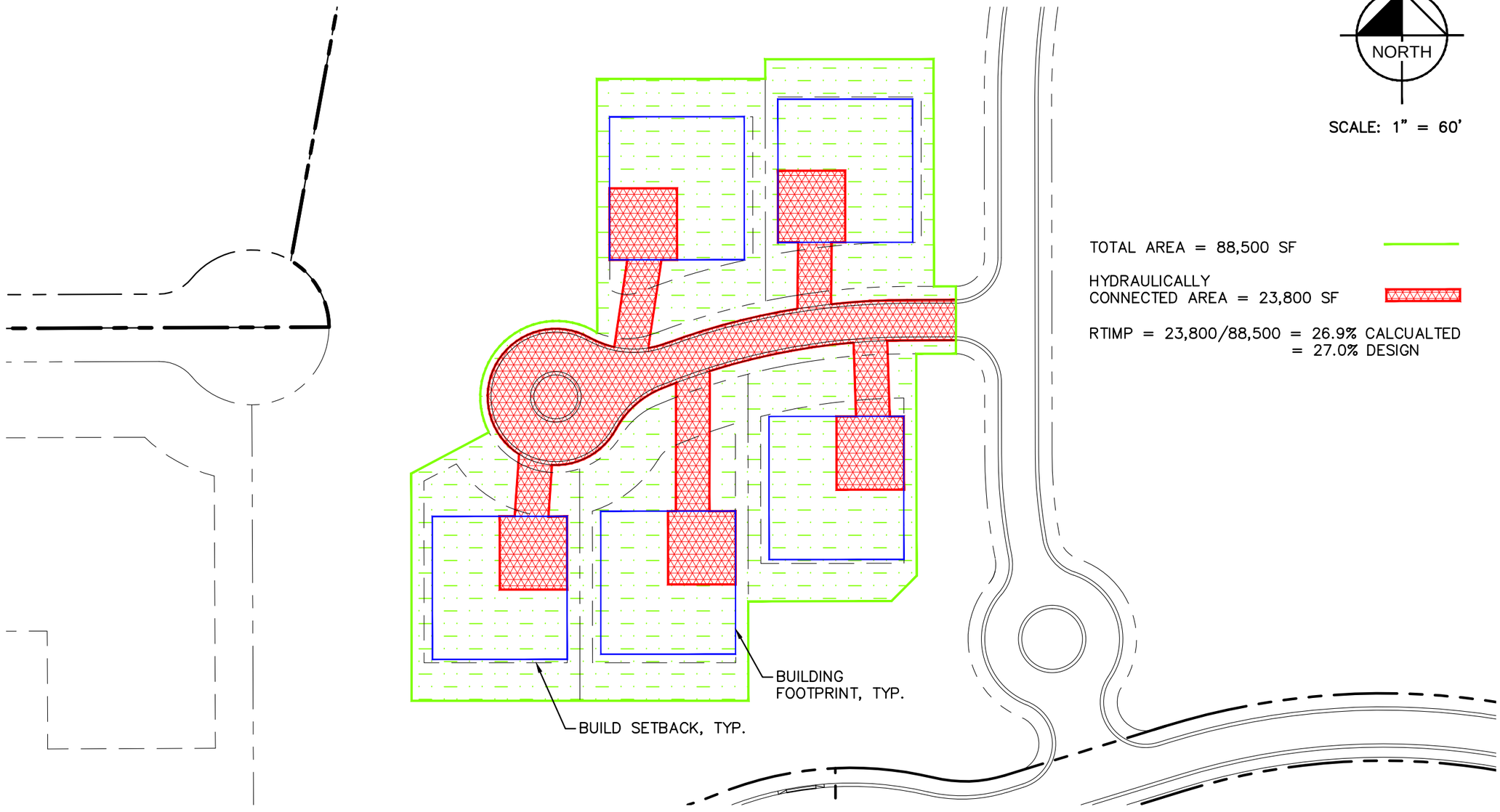
PROJECT NO.
291203001

DRAWING NAME

1 OF 1

3-WM-2020
8/28/2020

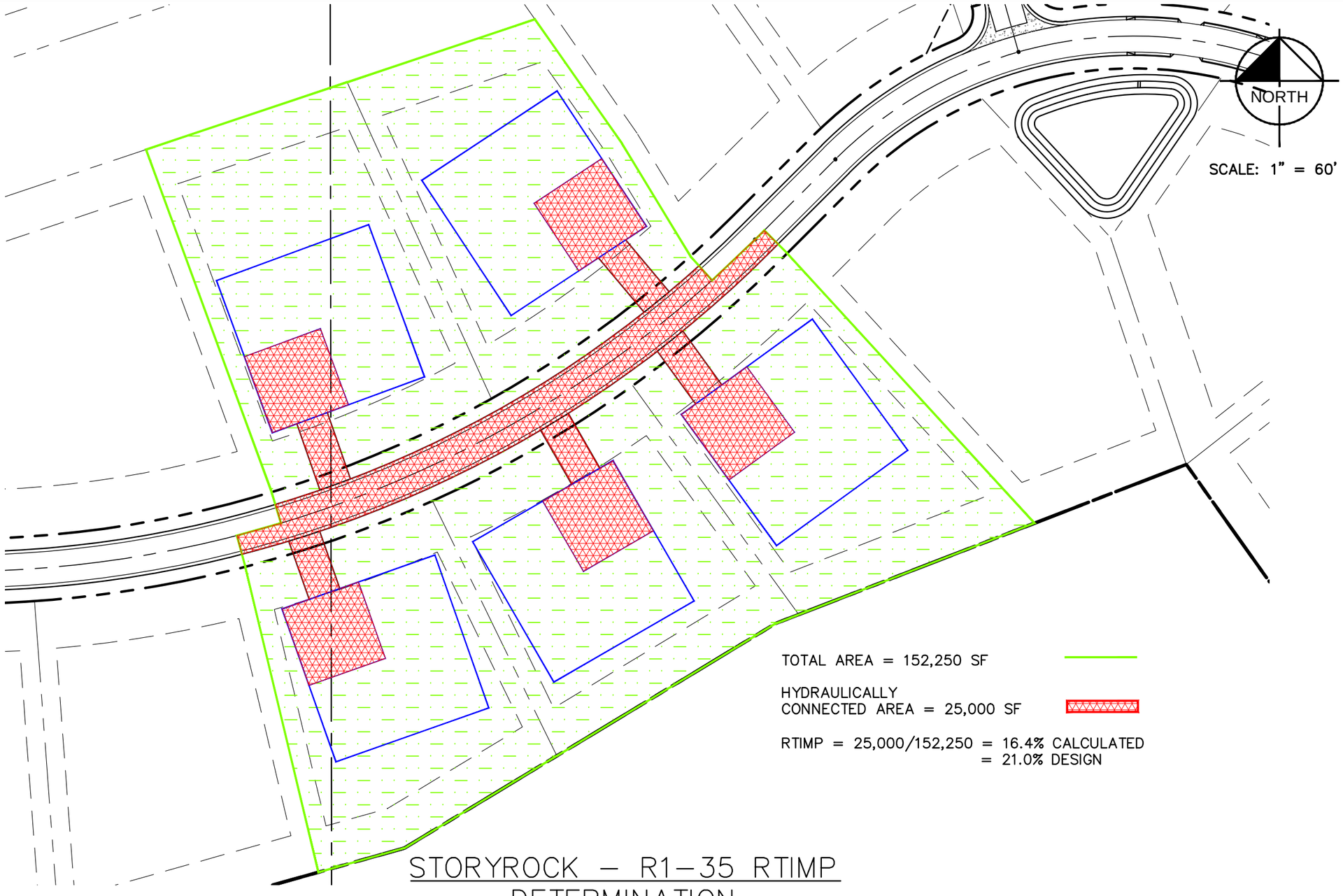
K:\EAV_Civil\291203001 - HV92\Drainage\Preliminary\Figures\Prop Land Use.dwg Sep 25, 2019 zach.hill



STORYROCK – R1–18 RTIMP DETERMINATION

Kimley»Horn

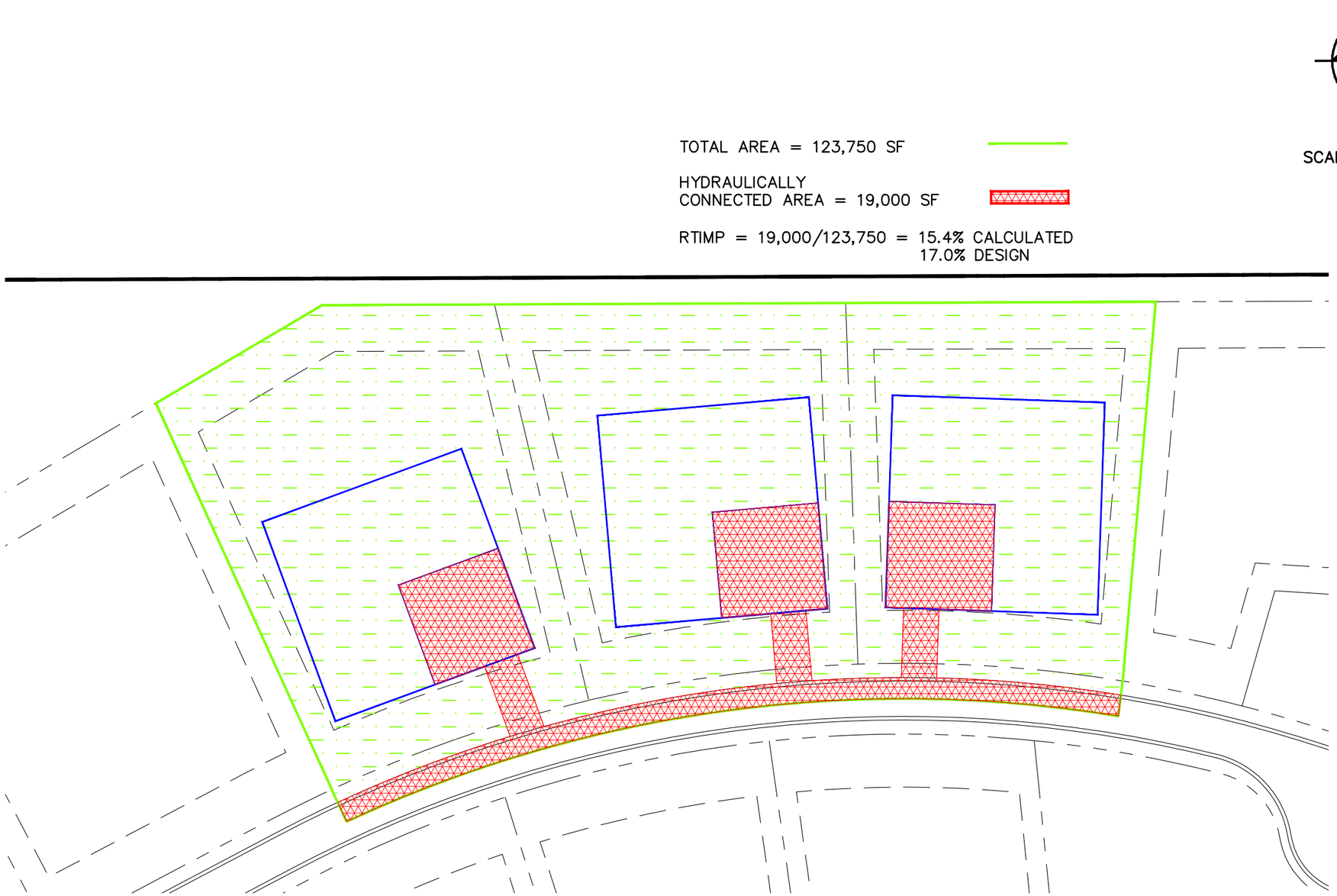
3-WM-2020
8/28/2020



STORYROCK – R1–35 RTIMP DETERMINATION

Kimley»Horn

3-WM-2020
8/28/2020

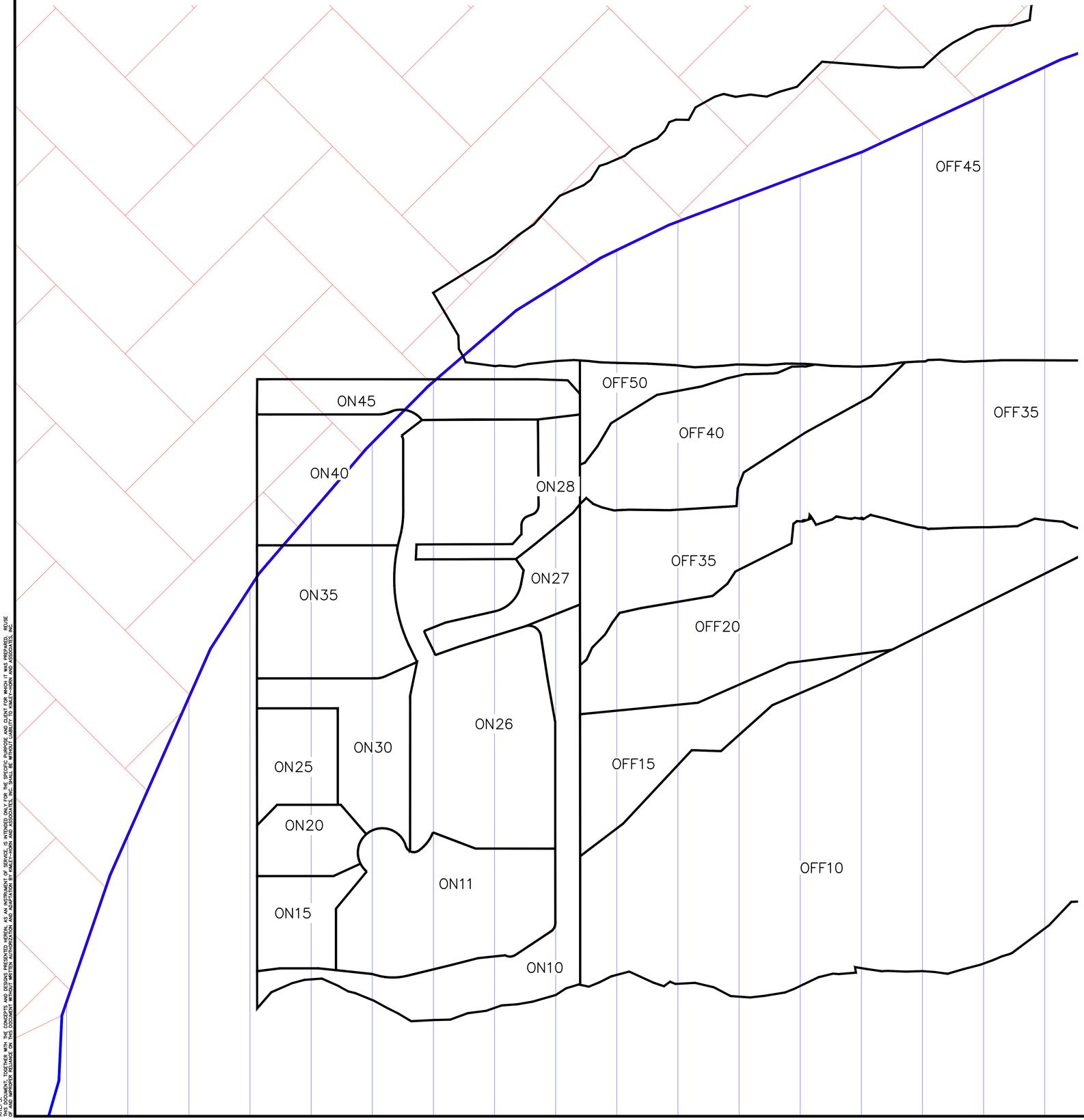


STORYROCK – R1–43 RTIMP DETERMINATION

Kimley»Horn

3-WM-2020
8/28/2020

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	



OFF-SITE
SEE EXISTING
CONDITION
SOILS MAP

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

LEGEND

SUB-BASIN BOUNDARY

OFF10 SUB-BASIN ID

SOIL TYPES

121

6

93

63

33

61

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

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

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

SOLITUDE
PROPOSED CONDITION
HEC 1 - SOILS MAP
SCOTTSDALE, ARIZONA

PROJECT NO.
291203001

DRAWING NAME

1 OF 1

3-WM-2020
8/28/2020

Storage Basin ID:	**DB10**										
Spillway Characteristics (SS)			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
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)			**11**	**12**	**13**	**14.**	**15**	**16**	**17**	**18**	**19**	**20**
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)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
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)			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
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)			**11**	**12**	**13**	**14.**	**15**	**16**	**17**	**18**	**19**	**20**
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)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
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-											

Storage Basin ID:	**DB35**										
Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
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)			11	12	13	14.	15	16	17	18	19	20
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)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
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-											

Kimley»Horn

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 ft^2
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		0	0	0
			0.04	1.0	0.04		2.38			
1	2,200	0.05				0.04		0	0	0
			0.06	1.0	0.06		1.05			
2	3,300	0.08				0.10		1	0	1
			0.09	1.0	0.09		0.88			
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.

Kimley»Horn

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 ft^2
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	6,319	0.15				0		0	0	0
			0.17	1.0	0.17		5.50			
1	8,874	0.20				0.17		1	0	1
			0.23	1.0	0.23		2.23			
2	11,550	0.27				0.41		2	0	2
			0.29	1.0	0.29		1.69			
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.

Kimley»Horn

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 ft^2
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	1,940	0.04				0		0	0	0
			0.05	1.0	0.05		1.70			
1	2,750	0.06				0.05		1	0	1
			0.07	1.0	0.07		0.69			
2	3,580	0.08				0.13		2	0	2
			0.09	1.0	0.09		0.54			
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

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

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

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1*****************************************                    *********************************
 *                                       *                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                    *    U.S. ARMY CORPS OF ENGINEER
 *               JUN   1998              *                    *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1                *                    *          609 SECOND STREET
 *                                       *                    *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:50:46   *                    *           (916) 756-1104
 *                                       *                    *
 *****************************************                    *********************************

                                X     X  XXXXXXX   XXXXX          X
                                X     X  X        X     X         XX
                                X     X  X        X               X
                                XXXXXXX  XXXX     X        XXXXX  X
                                X     X  X        X               X
                                X     X  X        X     X         X
                                X     X  XXXXXXX   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
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             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
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```
             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
                         *
```



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          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
                         *
```
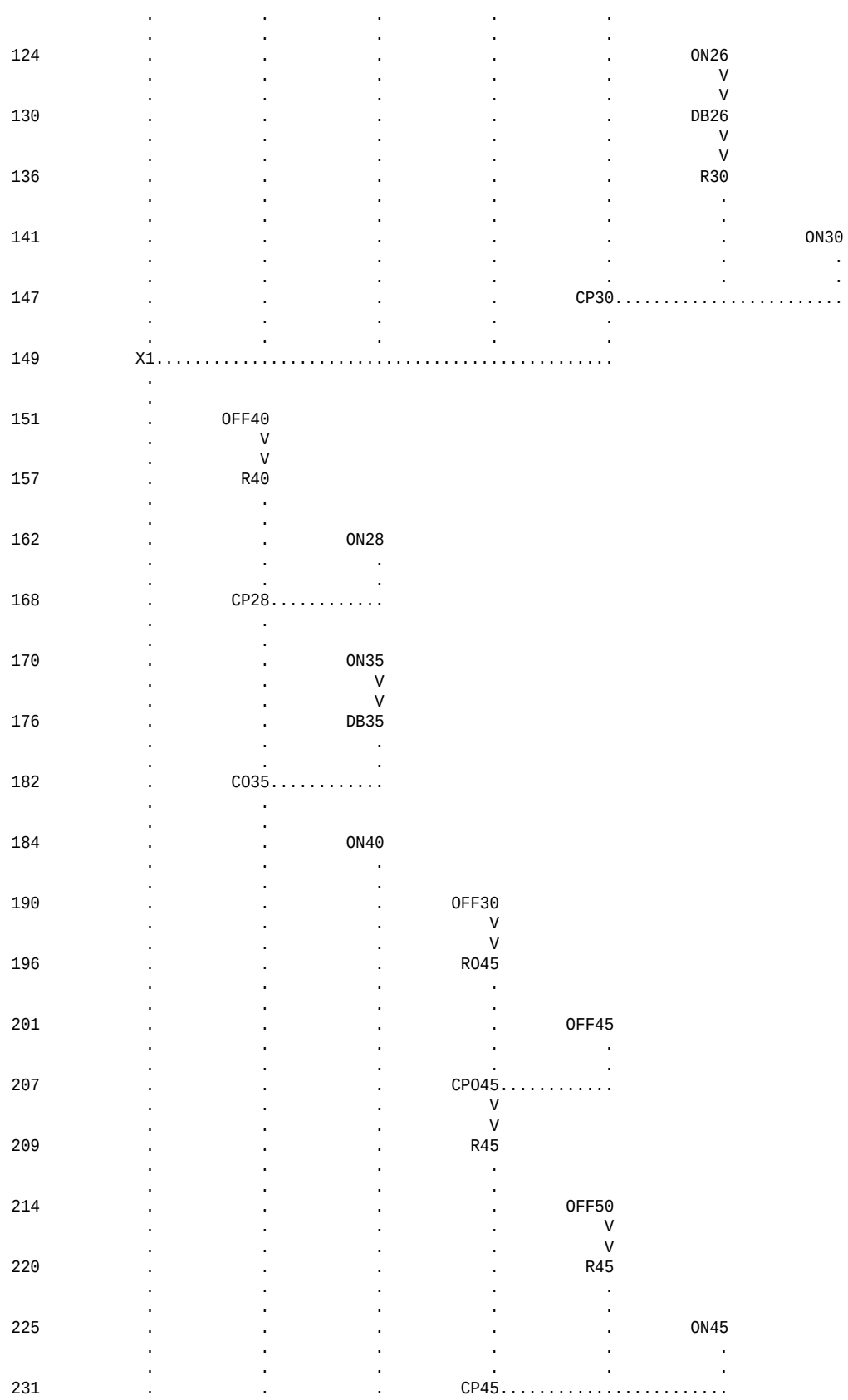

```
            130          KK    DB26 STORAGE
            131          KO
            132          RS       1    STOR
            133          SV            0.10    0.17    0.30    0.41    0.56    0.70    0.71
            134          SQ                            1.00    1.00    2.00    2.00    2.00
            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    CO35 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    RO45   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   CPO45 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

1********** **********

* * * *

* FLOOD HYDROGRAPH PACKAGE (HEC-1) * * U.S. ARMY CORPS OF ENGINEER

* JUN 1998 * * HYDROLOGIC ENGINEERING CENT

```
 *           VERSION 4.1               *                                               *         609 SECOND STREET
 *                                     *                                               *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:50:46   *                                             *           (916) 756-1104
 *                                     *                                               *
 ****************************************                                              *******************************




                                City of Scottsdale
                                SOLITUDE PROP - Solitude Proposed 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
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .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       .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

   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
```

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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       .01       .01       .01
                        .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        1.31  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


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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

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


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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

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

*** ***

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

  177 KO          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

                                     PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD       BASIN     MAXIMUM     TIME OF
          OPERATION       STATION    FLOW     PEAK                                            AREA      STAGE     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						
+		CO35	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						
+		RO45	7.	4.60	2.	0.	0.	.04
	HYDROGRAPH AT						
+		OFF45	25.	4.30	4.	1.	0.	.08
	2 COMBINED AT						
+		CPO45	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)   *                    *    U.S. ARMY CORPS OF ENGINEER
 *              JUN   1998               *                    *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1                *                    *          609 SECOND STREET
 *                                       *                    *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:51:04   *                    *           (916) 756-1104
 *                                       *                    *
 *****************************************                    *********************************

                                X     X  XXXXXXX   XXXXX          X
                                X     X  X        X     X         XX
                                X     X  X        X               X
                                XXXXXXX  XXXX     X        XXXXX  X
                                X     X  X        X               X
                                X     X  X        X     X         X
                                X     X  XXXXXXX   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
                         *
```



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          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
                         *
```
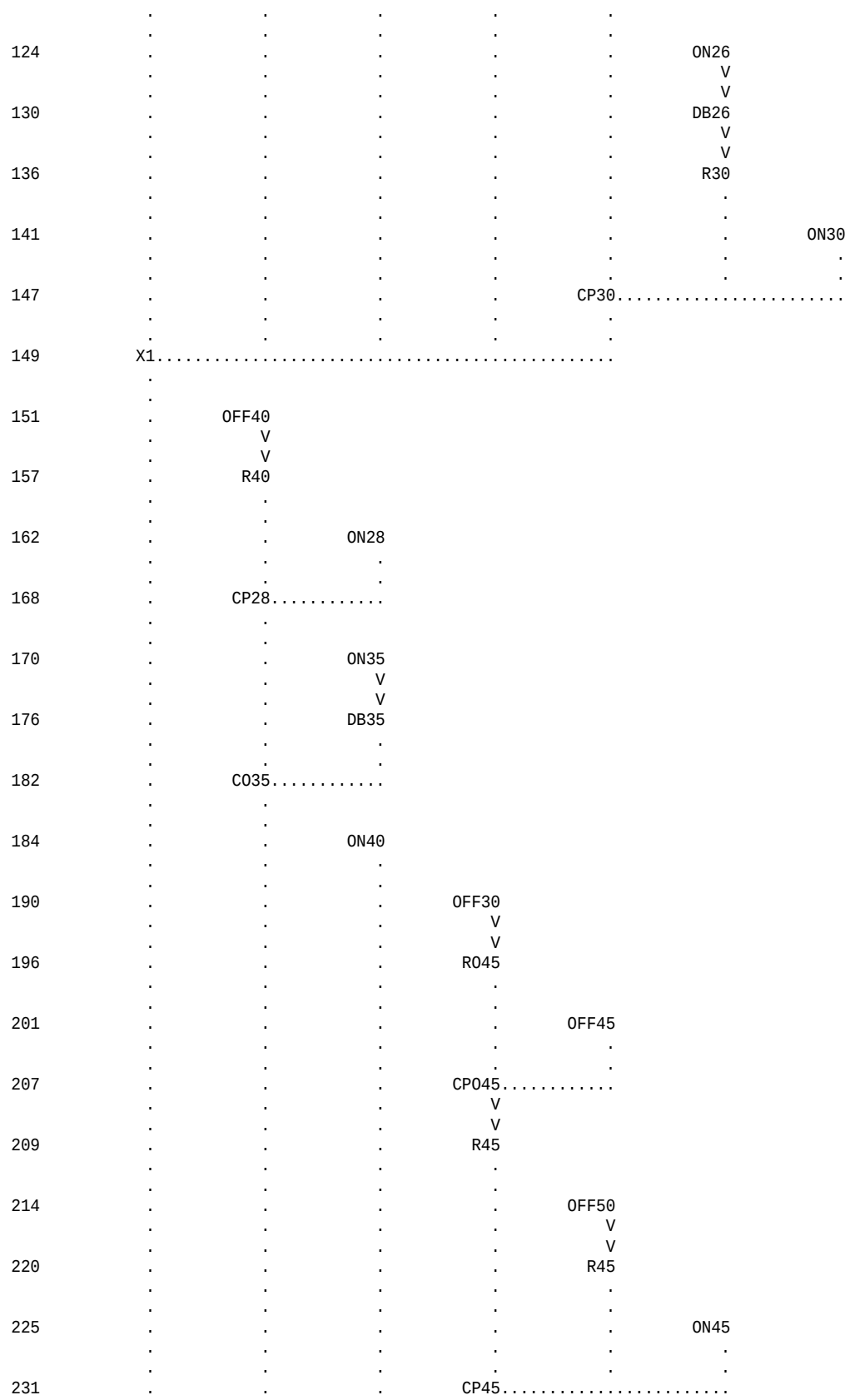

```
            130          KK    DB26 STORAGE
            131          KO
            132          RS       1    STOR
            133          SV            0.10    0.17    0.30    0.41    0.56    0.70    0.71
            134          SQ                            1.00    1.00    2.00    2.00    2.00
            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    CO35 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    RO45   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   CPO45 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
```



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1**********

* *

* FLOOD HYDROGRAPH PACKAGE (HEC-1) *

* JUN 1998 *

****

*

* U.S. ARMY CORPS OF ENGINEER

* HYDROLOGIC ENGINEERING CENT

* VERSION 4.1 *
* *
* RUN DATE 29JUL20 TIME 10:51:04 *
* *
****

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

City of Scottsdale
SOLITUDE PROP - Solitude Proposed 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
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .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       .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

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
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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       .01       .01       .01
                     .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
                     .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 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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

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

*** ***

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

  177 KO          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

                                       PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD       BASIN     MAXIMUM     TIME OF
          OPERATION       STATION      FLOW     PEAK                                            AREA      STAGE     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						
+		CO35	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						
+		RO45	17.	4.50	3.	1.	0.	.04
	HYDROGRAPH AT						
+		OFF45	55.	4.27	8.	2.	1.	.08
	2 COMBINED AT						
+		CPO45	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)   *                    *    U.S. ARMY CORPS OF ENGINEER
 *               JUN   1998              *                    *    HYDROLOGIC ENGINEERING CENT
 *            VERSION 4.1                *                    *          609 SECOND STREET
 *                                       *                    *       DAVIS, CALIFORNIA 95616
 *  RUN DATE   29JUL20  TIME  10:51:53   *                    *           (916) 756-1104
 *                                       *                    *
 *****************************************                    *********************************

                                X     X  XXXXXXX   XXXXX          X
                                X     X  X        X     X         XX
                                X     X  X        X               X
                                XXXXXXX  XXXX     X        XXXXX  X
                                X     X  X        X               X
                                X     X  X        X     X         X
                                X     X  XXXXXXX   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
                         *
```

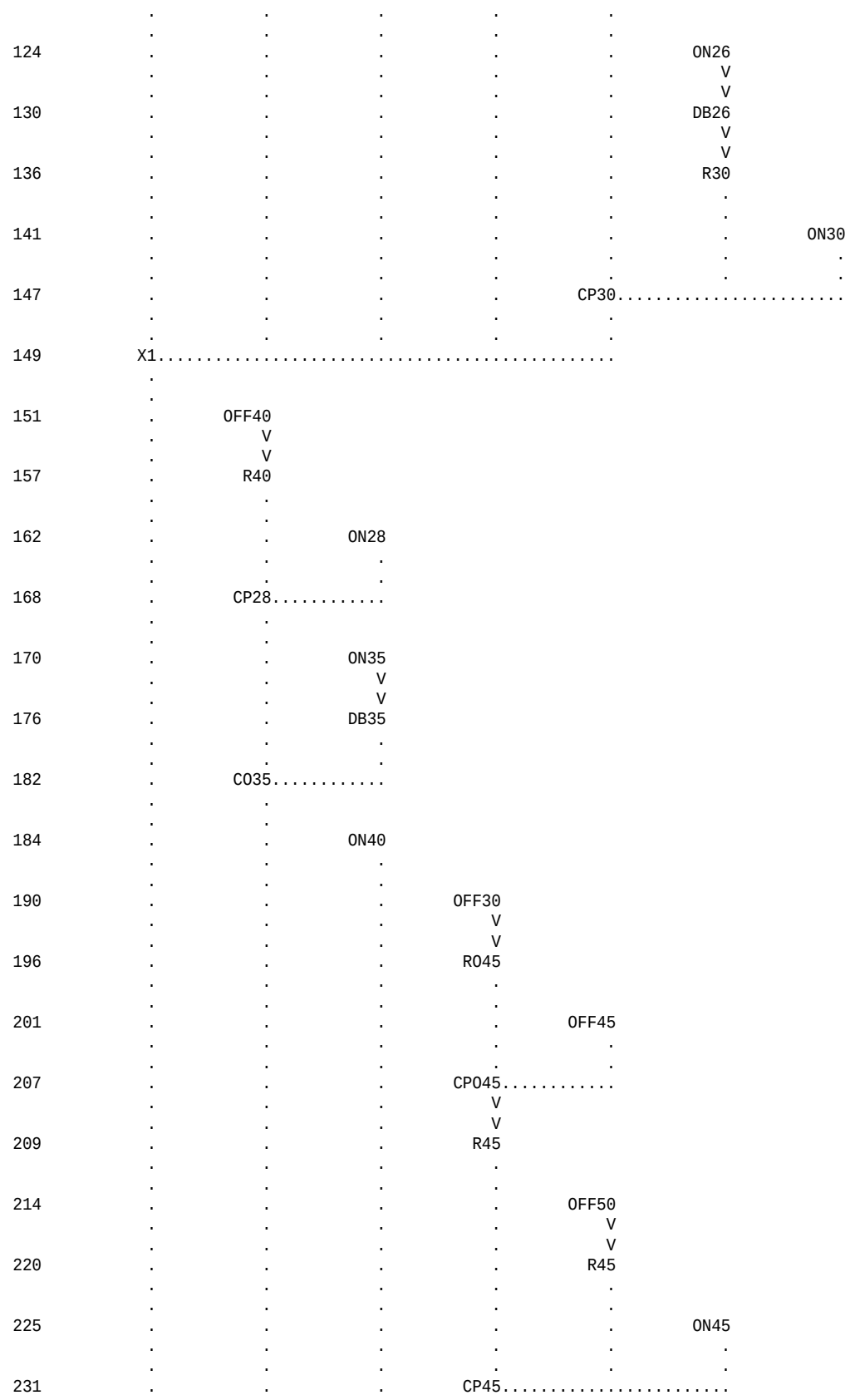


```
          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

            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    CO35 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    RO45   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   CPO45 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
```



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1********** **********

* * * *

* FLOOD HYDROGRAPH PACKAGE (HEC-1) * * U.S. ARMY CORPS OF ENGINEER

* JUN 1998 * * HYDROLOGIC ENGINEERING CENT

* VERSION 4.1 *
*
* RUN DATE 29JUL20 TIME 10:51:53 *
*
****

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

City of Scottsdale
SOLITUDE PROP - Solitude Proposed 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
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .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       .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

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
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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       .01       .01       .01
                    .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
                    .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 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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

 131 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
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            **************
            *            *
 176 KK     *      DB35  *      STORAGE
            *            *
            **************

 177 KO          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

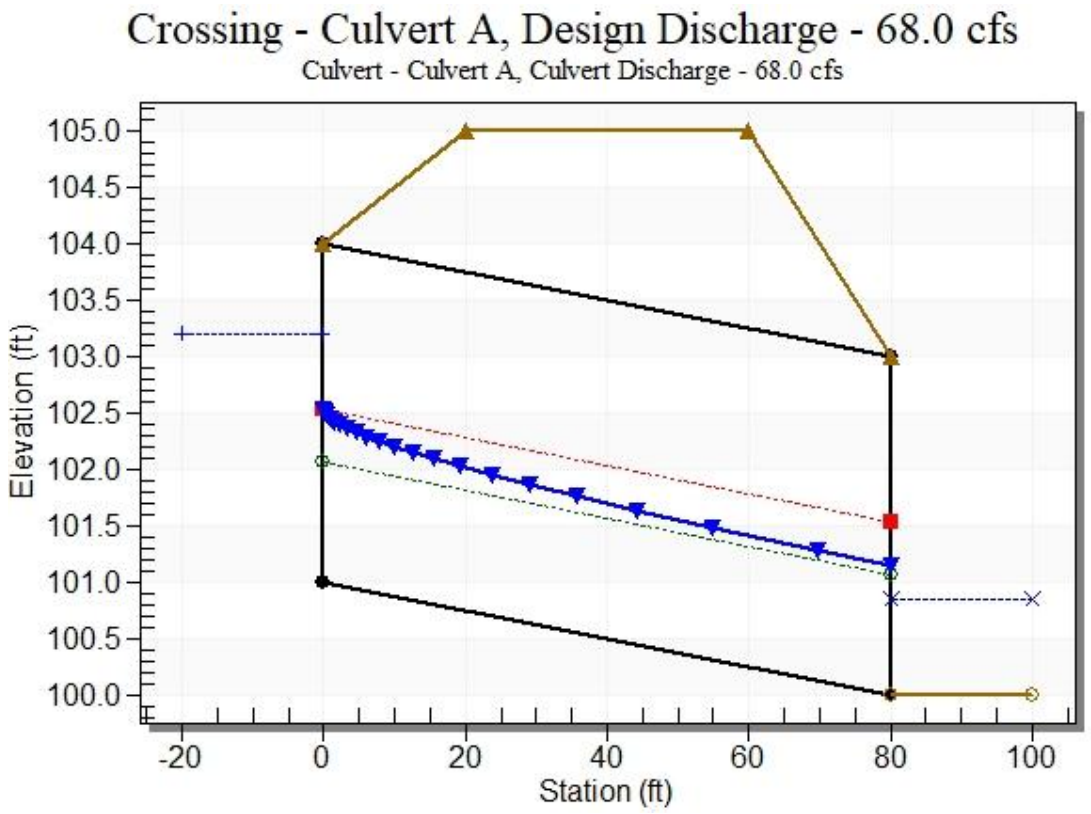
Inlet Elevation (invert): 101.00 ft, Outlet Elevation (invert): 100.00 ft

Culvert Length: 80.01 ft, Culvert Slope: 0.0125

****

Culvert Performance Curve Plot: Culvert A

Water Surface Profile Plot for Culvert: Culvert A



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

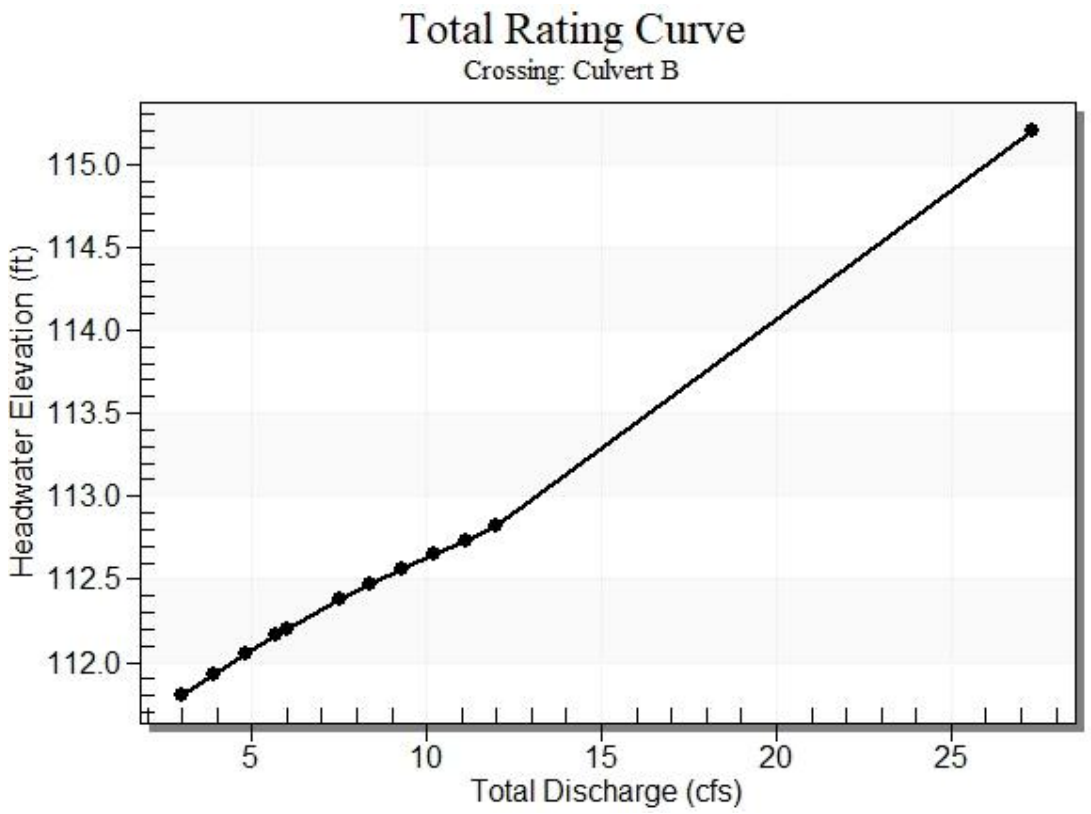


Table 5 - Culvert Summary Table: Culvert B

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

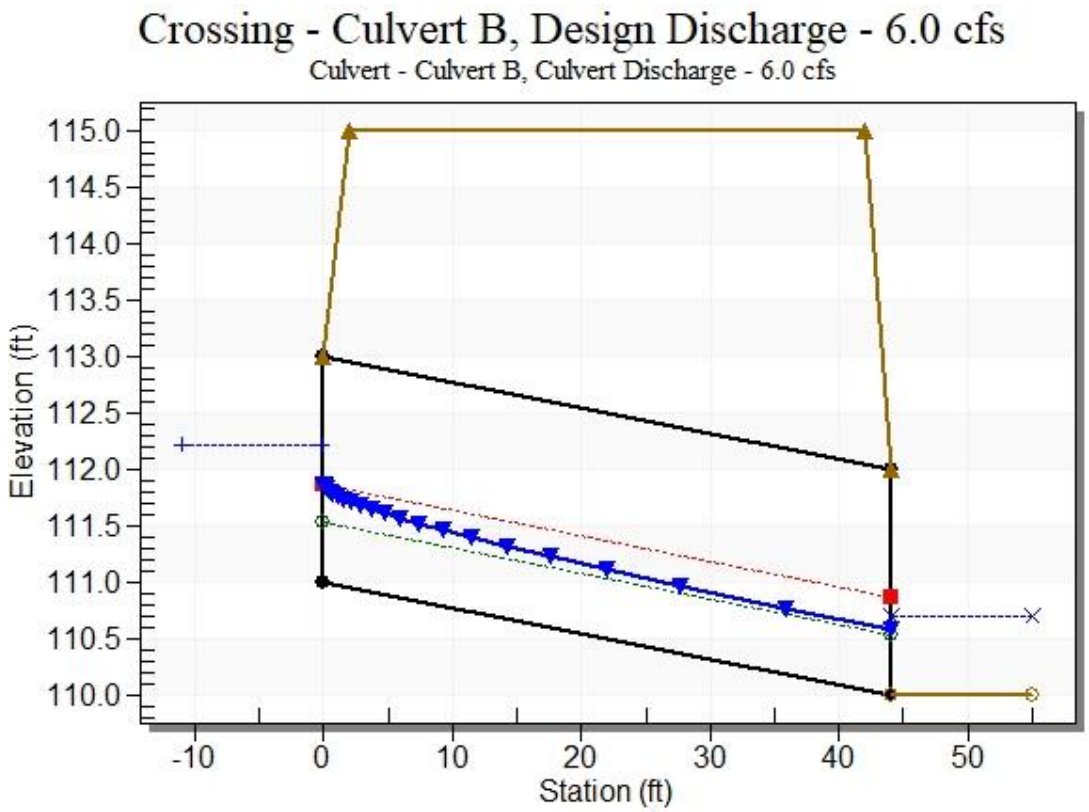
Inlet Elevation (invert): 111.00 ft, Outlet Elevation (invert): 110.00 ft

Culvert Length: 44.01 ft, Culvert Slope: 0.0227

****

Culvert Performance Curve Plot: Culvert B

Water Surface Profile Plot for Culvert: Culvert B



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

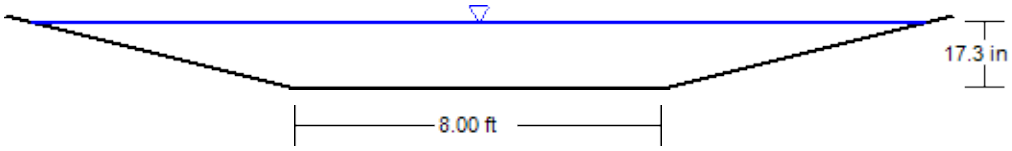
Channel Invert Elevation: 106.00 ft

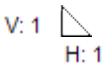
Wash Cross Sections Existing Condition

Cross Section for Chnl A

Project Description	
Friction Method	Manning Formula
Solve For	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	ft²
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	

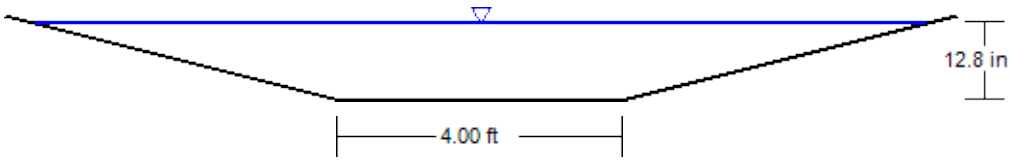
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

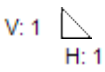
GVF Output Data		
Upstream Depth	0.0	in
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	17.3	in
Critical Depth	20.0	in
Channel Slope	0.040	ft/ft
Critical Slope	0.023	ft/ft

Cross Section for Chnl C

Project Description	
Friction Method	Manning Formula
Solve For	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





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	ft²
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 Formula
Solve For	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 ft²
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

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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 ft²
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 ft²
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

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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 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	155.00 cfs

Results	
Normal Depth	17.8 in
Flow Area	20.6 ft²
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 ft²
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

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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	ft²
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,

Sallie Diebolt

Sallie Diebolt
Chief, Arizona Branch
Regulatory Division

DRY LAND APPROVED JURISDICTIONAL DETERMINATION FORM[1]
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.

Aerial Source/Date: NearMap 2019

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

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