PRELIMINARY/FINAL DRAINAGE REPORT

FOR

APPALOOSA HWY 24 SUBDIVISION FILING NO. 2, LOTS 1, 2 & 3

Drainage calculations have not been reviewed at this time. Due to the fact that the plan and the narrative have multiple discrepancies, please make corrections.

Reviewer reserves the right to make additional comments based on the volume of comments provided herein. Prepared For: Platte Valley, LLC 1378 Promontory Bluff View Colorado Springs, CO 80921

Prepared By: sociated Design Professionals, Inc. 20 Austin Bluffs Parkway Suite 102 Colorado Springs, CO 80918 719.266-5212

> ADP Project No. 160504 May 16, 2018

Please state when improvements will be completed and who will maintain all drainage and WQ structures, please include who currently and in the future is responsible to maintain the concrete channel.

ADPCIVIL ENGINEERING FOR THE FUTURE



ENGINEER'S STATEMENT:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports, and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

Michael A. Bartusek, P.E. #23329

DEVELOPER'S STATEMENT:

I, the Developer, have read and will comply with all of the requirements specified in this drainage report and plan.

By: _

Ron Waldthausen

Title: President

Address: Platte Valley, LLC 1378 Promontory Bluff View Colorado Springs, CO 80921

Filed in accordance the El Paso County Land Development Code, Drainage Criteria Manual Volumes 1 and 2, and the Engineering Criteria Manual, as amended.

Jennifer Irvine, County Engineer/ECM Administrator

Date

Conditions:

PRELIMINARY/FINAL DRAINAGE REPORT APPALOOSA SUBDIVISION FILING No. 2, LOTS 1, 2 & 3

please complete filing -name, should be same as proposed plat.

El Paso County

PROJECT DESCRIPTION

This drainage report is for the development of the Appaloosa Subdivision, Filing No. 2, Lots 1, 2 & 3. The currently vacant 4.67 acre site is located north of U.S. Hwy 24 and east of Amelia Street. It is further described as the southern portion of Section 7, Township 14 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado.

All of this lot is located in Sand Creek drainage basin and drains into the central tributary of Sand Creek. An existing 4'x4' box culvert is located at the southeast corner of U.S. Hwy 24 and Amelia St. Also an existing concrete channel is located on the east side of proposed Lot 3.

SOILS

The soil on the site can be described as having a rapid permeability, medium-surface runoff, and moderate to high hazard of erosion. The soils within the site are Truckton sandy loams. These soils are classified as Hydrologic Group 'B'.

FLOODPLAIN STATEMENT

–Map No. 08041C0754 F

A small portion of the developed site is located within a designated FEMA 100-year floodplain according to the information published in the Federal Emergency Management Agency Flood Plain Map No. 080059C0754F, dated March 17, 1997, and LOMR 05-08-0368P dated May 23, 2007. This area falls within the existing concrete channel.

METHOD OF COMPUTATION

The methodology utilized for this report is in accordance with the *City Drainage Criteria Manual, Volumes 1*, dated May 2014. The Rational Method for computation of runoff was used for determining Sub-Basin flows.

Q = cia

Where

Q = maximum rate of runoff in cubic feet per second

- c = runoff coefficient representing drainage area characteristics
- i = average rainfall intensity, in inches per hour, for the duration required for the runoff to become established
- a = drainage basin size in acres

EXISTING DRAINAGE CONDITIONS

The existing site has been overlot graded and is covered with rangeland grasses. The western portion of the site drains in a southerly direction toward the existing 4' x 4' box culvert under U.S. Hwy 24. The eastern portion of the site drains westerly toward the 4' x 4' box culvert. An existing concrete channel is located on the east side of the lot, but no flows from this parcel drain to the concrete channel. A portion of the concrete channel has failed with other portions showing signs of joint failure.

The existing sub-basin AEX produces flows of 0.8 cfs for the 5-year storm and 6.3 cfs for the 100-year storm.

where can I find a plan depicting this area? what is the acreage of this basin? please call out on plan and call out Design point in text at this location for pre development and post development.

sub-basin designations
should match plan.

doesn't match plan.

DEVELOPED DRAINAGE CONDITIONS

please elaborate what this statement means, ie elf contained, but flows to lot 3?

The developed site will be divided into three (3) lots. Lots 1 and 2 will encompass 0.98 acres each and Lot 3 will encompass 2.7 acres. The proposed land is zoned I-2 (Limited Industrial). Drainage from each lot will be self-contained with all flows directed to an extended detention basin (EDB) facility in the southwest corner of Lot 3 southerly

Lot 1, Sub-basin A, is located in the northern portion of the site. Sub-basin A will produce flows of 1.6 cfs for the 5-year storm and 3.5 cfs for the 100-year storm. These flows will continue south and be intercepted by a proposed swale located along the property line. The flows will then travel west to a proposed type 'C' inlet at the southwest corner of the site. An 18" HDPE storm sewer will transport these flows into Lot 2.

southerly

—through

Lot 2, Sub-basin B, is located in the center of the site. Sub-basin B will produce flows of 1.6 cfs for the 5-year storm and 3.5 cfs for the 100-year storm. As with Lot 1 the site flows will be intercepted by a swale located along the property line. These flows will be intercepted by a type 'C' inlet at the southwest corner of the lot. These flows will combine with the flows from Sub-basin A at DP1 to produce flows of 3.2 cfs for the 5-year storm and 7.0 cfs for the 100-year storm. An 18" HDPE storm sewer will transport these flows into the proposed EDB in Lot 3.

Lot 3, Sub-basin C, is located in the southern portion of the site. Sub-basin C will produce flows of 3.7 cfs and 8.3 cfs respectively. These flows will be intercepted by a proposed swale located along the south property line and into the proposed EDB. The combined flows into the basin at DP2 will be 6.5 cfs for the 5-year storm and 14.3 cfs for the 100-year storm. See comment on

doesn't match plan

Ine proposed 0.656 ac.ft. EDB will reduce the site flows into the existing 4' x 4' box culvert to 3.9 cfs for the 5-year storm and 5.3 cfs for the 100-year storm.

CONCRETE CHANNEL REPAIR

Approximately 120 lf of the existing concrete channel will need to be removed and replaced. The channel section is 6 feet wide and 7 feet deep. The new concrete channel section will be doweled into the concrete channel sections which remain.

WATER QUALITY AND DETENTION

Water quality for the site will be achieved within by 0.118 acre-feet of storage, 1.85 ft deep within the 0.656 ac. ft. extended detention basin (EDB). The remainder of the basin will provide the storage volume required for detention. The facility will have an 18" HDPE outlet pipe with a 12" restrictor plate located 6.5" above the pipe invert.

PRIVATE DRAINAGE FACILITIES Item Unit Total Cost Quantity Unit Cost 18" HDPE FES EA 1 \$450 \$ 450.00 18" HDPE LF 400 \$45 \$18,000.00 **Outlet Structure** EA 1 \$5.000 \$ 5,000.00 **Emergency Spillway** EA 1 \$1,500 \$ 1,500.00 Type 'C' Inlet 2 EA \$3,270 \$ 6,540.00 **Concrete Channel** LF 120 \$150 \$18.000.00 Sub-Total \$49,490.00 15% Contingency & Engineering <u>\$ 7,423.50</u> please state who owns and maintains the TOTAL \$56,913.50 concrete channel, and confirm that you have Please provide for all an easement to work on the entire width of 2 Page structures of the pond. the channel. ie: forebay and FES

going into the pond, trickle channel, etc.

all pipe within the public ROW shall be RCP.

plan re: DP2

be labeled as a DP (3)

please make changes as appropriate based on planning comments on minimum lot size.

DRAINAGE BASIN FEES

Based on a resolution, No. 16-336, passed by the Board of County Commissioners on September 29, 2016, drainage and bridge fees will only be assessed on the two (2) smaller lots in the replat. The area of the two (2) smaller lots is 1.96 acres.

The proposed development is located within the Sand Creek drainage basin. The 2018 drainage basin fee calculation is as follows:

Impervious Coverage	=	73.6%
Area Subject to Fee	=	0.736 x 1.96 acres = 1.443 acre
Sand Creek Basin Fee	=	\$17,197/acre
Drainage Basin Fee	=	\$17,197 x 1.443 = \$24,815
Sand Creek Bridge Fee	=	\$5,210
Bridge Fee		\$5,210 x 1.443 = \$7,518

CONCLUSION

The proposed development and subsequent lot developments follow the "Four Step Process" as mandated by the EPA as follows:

Step 1: Runoff has been reduced by disconnecting impervious areas where possible, eliminating "unnecessary" impervious areas and encouraging infiltration into suitable soils.

Step 2: All drainageways, ditches and channels have been stabilized by the following methods:

- Tributaries have been left in their relatively natural state where possible.
- New drainageways and swales have been stabilized with either riprap or erosion control fabric depending on the erosion potential.
- No new roadside ditches are proposed for the development.

Step 3: The proposed development will disturb approximately 4.5 acres, although the initial disturbance will only be 0.7 acres.

Step 4: The development of this project will not affect sensitive waters.

The development of this site will have little impact on downstream properties once the EDB is constructed.

Please elaborate on the four step process. for example the use of the swales for step one. provide details for all four steps.

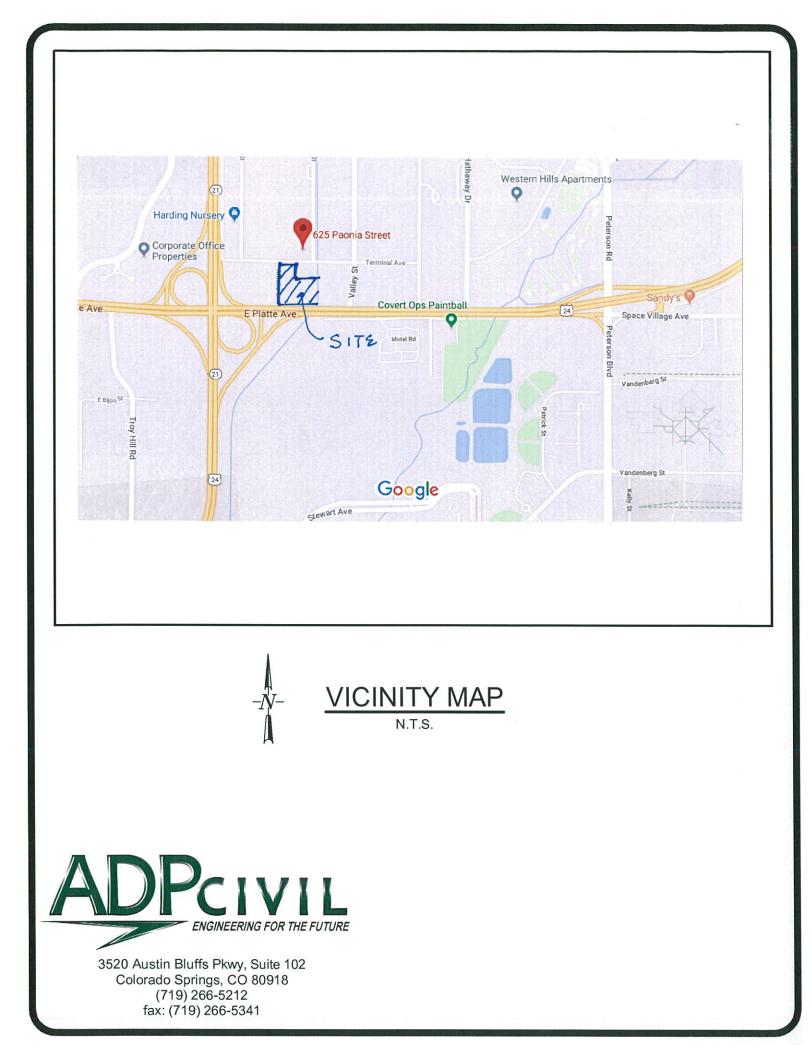
REFERENCES

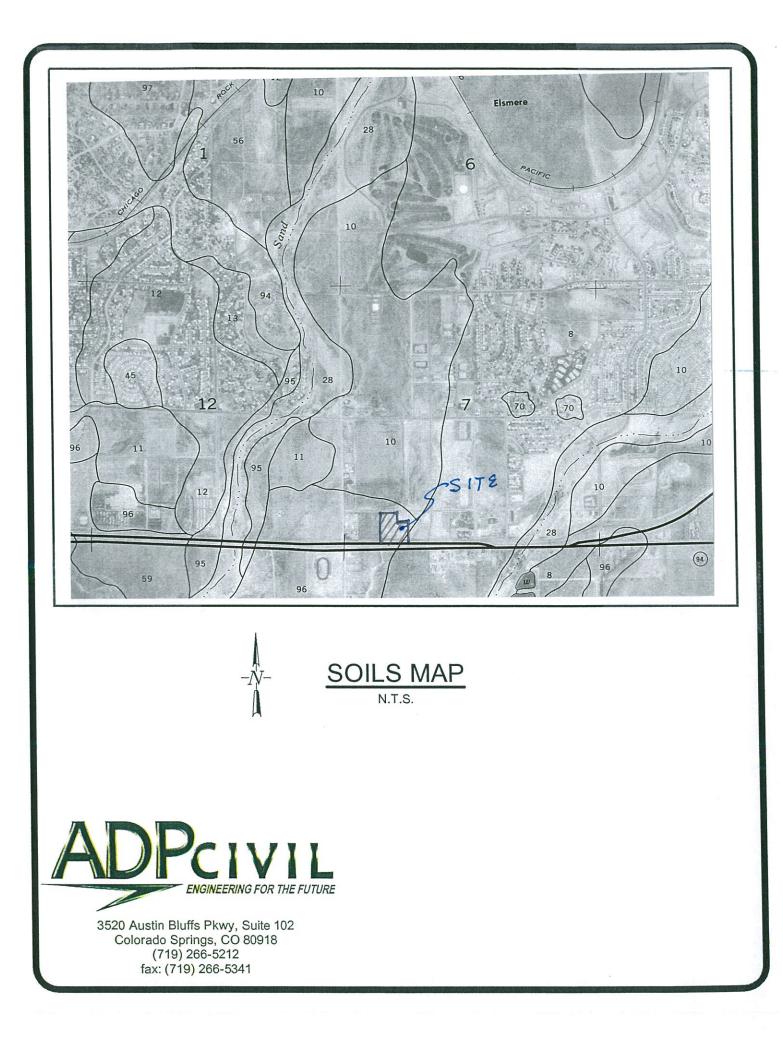
~

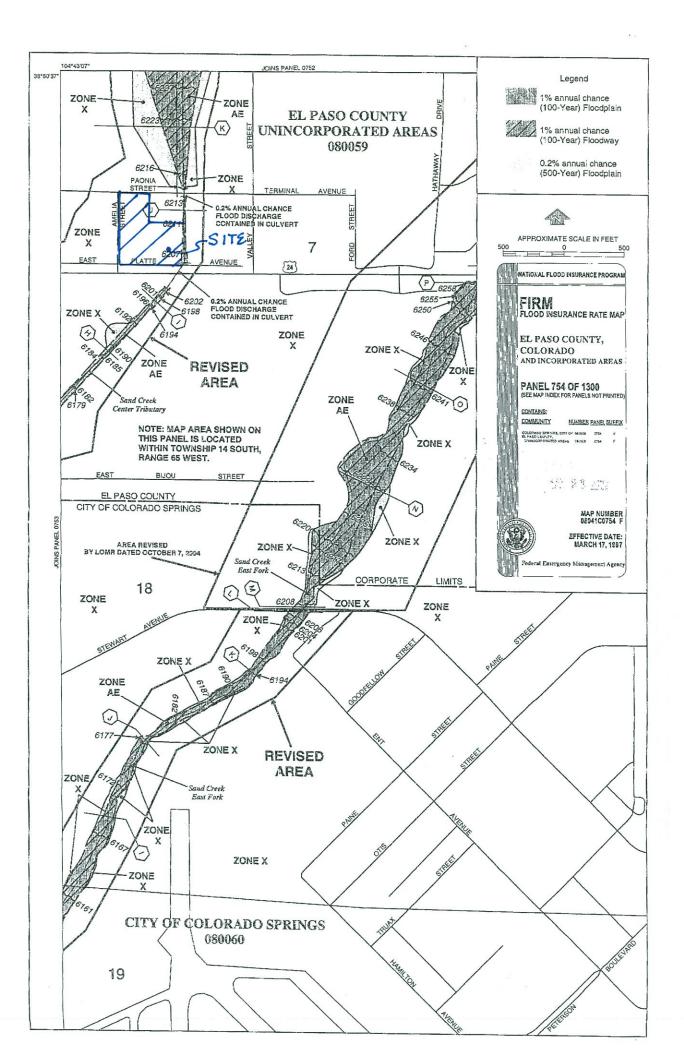
- City of Colorado Springs and El Paso County (1994). *Drainage Criteria Manual Volume* 1 (DCM).
- 2. City of Colorado Springs and El Paso County (1994). *Drainage Criteria Manual Volume II* (DCM).
- 3. Soil Survey of El Paso County Area, Colorado by USDA, NRCS.
- 4. El Paso County (January 2006) Engineering Criteria Manual.
- 5. Urban Drainage and Flood Control District (June 2011). Urban Storm Drainage Criteria Manual, Volume 1-3.
- 6. Sand Creek Drainage Basin Planning Study (DBPS).
- 7. Preliminary/Final Drainage Plan and Report for the Appaloosa Hwy 24 Subdivision by Oliver E. Watts, Consulting Engineer, dated November, 2000.

APPENDIX A

MAPS







APPENDIX B

DESIGN CALCULATIONS

APPALOOSA SUBDIVISION	VISION																			
PROJ. #160504	ATION SHEET										_									
file:appaloosa dr																				
04/24/18																				
						Ī	nitial Tci	╞	Tra	ravel Time	_		-				length	vel.		
AREA AREA	EA C5		C100 C(C5 X A C	C100 X A		0	+		0				1100	Q5	Q100	_	>	٩v	AREA
DESIG. (acre)	e) (5 yr)	r) (100 yr)	yr)			L (ft)	(%)	(min)	L (ft) ((%) (f	(fps) (min)	n) (min)	(in/hr)	(in/hr)	(cfs)	(cfs)	(feet)	(tps)	(min)	DESIG.
EXISTING CONDITIONS	SN																			
Aex		0.08	0.35	0.37	1.60	250	1.20	28.40	300	1.30 1	1.20 4.	4.17 32.56	56 2.21	1 3.86	0.81	6.18				Aex
DEVELOPED CONDITIONS	TIONS															X		00.01		
A1	1.00	0.49	0.62	0.49	0.62	175	_	11.63							1.62	3.57	ngl	00.01	97.0	AI
		0.49	0.62	0.48	0.61	175	2.20	11.63	170 (0.50 0	0.70 4.	4.05 15.68				3.50				P 2
DP1	1.98			0.97	1.23											7.02	175	10.00	0.29	140
		0.49	0.62	1.27	1.61	250	1.20	16.98	300	1.30 1	1.20 4.	4.17 21.15				7.96				R3
2	4.58			2.24	2.84							21.15	15 2.83	3 4.94	6.35	14.02				DP2
															C.					
IMPERVIOUS AREA CALC								π	≓∣	CALCULY	ALICNS			CULATIO						
Description	% vradml	%						<u>A</u>	R			O %Z	2% UF WUV							
UNDEV		0						ę	= 0.5'			0.02 ;	0.02 X 0.118 = 0.002 AF = 102 CF).002 AF =	102 CF					
LOOSE GRAVEL		80						υ	= 3.2											
PAVED PARKING		100										Ч. Ч.	BAY NUI	CH CALC	FUREBAY NOICH CALCULATIONS					
BUILDINGS		100						a	= d''1.5xbxC	xbxC		25 OI	25 OF 100YR FLOW	MO						
								a	= 11.3 0	cfs		0.02	0.02 X 14.0 = 0.28 CFS	28 CFS						
			Ш	nperious A	Imperious Area Description	ption						N =C	W =Q/(D61.5XC							
			<u>ة</u>			Total		đ	PIPE CAPACITY	CITY		W=0.	W=0.28/(1X3.0)=0.09 F1	=0.09 FT						
Subasin Area	a Landscape	cape Building		Parking C	Gravel	Imperv		A	IE											
								S	= 1.0%											
A1	1.00	0.16	0.04	0.20	0.60	72.0		Ħ	= 0.012											
A2 (0.98	0.14	0.04	0.20	0.60	73.5		a	max = 11	11.4 cfs										
	2.60	0.35	0.25	0.40	1.60	74.2														
T otal	4.58					73.6		_		_			_	_						

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

ZONE 3				
100-YR	E1	T		
NOLUME EURY WOCY		-		-
	/	100.YE		
PERMANENT OPEPICE	ND 2	CHUPK	•	
POOL Example Zone C	onfiguratio	on (Retenti	on Pond)	
tequired Volume Calculation Selected BMP Type =	EDB			
Watershed Area =	4.58	acres		
Watershed Length =	550	ft		
Watershed Slope =	0.012	ft/ft		
Watershed Imperviousness =	76.70%	percent		
Percentage Hydrologic Soil Group A =	0.0%	percent		
Percentage Hydrologic Soil Group B =	100.0%	percent		
Percentage Hydrologic Soil Groups C/D =	0.0%	percent		
Desired WQCV Drain Time =	40.0	hours		
Location for 1-hr Rainfall Depths = I	Derwer - Cap	ottol Building		
Water Quality Capture Volume (WQCV) =	0.118	acre-feet	Optional Use	
Excess Urban Runoff Volume (EURV) =	0.389	acre-feet	1-hr Precipit	ation
2-yr Runoff Volume (P1 = 1.19 in.) =	0.327	acre-feet	1.19	inche
5-yr Runoff Volume (P1 = 1.5 in.) =	0.431	acre-feet	1.50	inche
10-yr Runoff Volume (P1 = 1.75 in.) =	0.538	acre-feet	1.75	inche
25-yr Runoff Volume (P1 = 2 in.) =	0.002	acre-feet	2.00	inche
50-yr Runoff Volume (P1 = 2.25 in.) =	0.757	acre-feet	2.25	inche
100-yr Runoff Volume (P1 = 2.52 in.) =	0.880	acre-feet	2.52	inche
500-yr Runoff Volume (P1 = 3.01 in.) =	1.098	acre-feet	3.01	inche
Approximate 2-yr Detention Volume =	0.307	acre-feet	-	_
Approximate 5-yr Detention Volume =	0.405	acre-feet		
Approximate 10-yr Detention Volume =	0.506	acre-feet		
Approximate 25-yr Detention Volume =	0.542	acre-feet		
Approximate 50-yr Detention Volume =	0.564	acre-feet		
		-		

Project: Appaloosa Subdivisi

Depth Increment =									
	0.25	ft Optional				Optional			
Stage - Storage	Stage	Override	Length	Width	Area	Override	Area	Volume	Ve
Description	(ft) 0.00	Stage (ft)	(ft)	(ft)	(#*2)	Area (ft*2)	(acre)	(ft*3)	(8
Top of Micropool								a town to be	
13.4	0.33					6.362.0		0	C
	0.50					83852		0	0
	0.75	SAL STOL				5.00 5X		0	0
Floor	0.93	Services?				DANKER		124	(
	1.00	Second Second				(182) (182)		471	(
	1.25	2012/01/01						1,762	0
	1.50					ALC: NO		3,111	(
	1.75					01,22:85		4,519	(
Zone 1 (WQCV)	1.86	19608633				10.66.644		5,216	(
	2.00	-200006.				Control River	10.20000	5,987	(
	2.25	an a				CORPORT MICH		7,578	0
	2.50	No. of Concession, Name				124018		9,171	
	2.75	Subscribes	110.9	60.9	6,754	DOCTOR SAL	0.155	10,828	
	3.00	a service a	112.4	62.4	7,014	Designer St	0.161	12,549	
	3.25	CONTRACT.	113.9	63.9	7,279	1000	0.167	14,335	
	3.50	10000	115.4	65.4	7,548	12000000	0.173	16,189	
Zone 2 (EURV)	3.61	Par Allen	116.0	66.1	7,668	10000000	0.176	17,026	1
	3.75	-	116.9	66.9	7,821		0.180	18,110	
	4.00		118.4	68.4	8,099		0.186	20,100	
	4.00		118.4	69.9	8,382		0.192	20,100	
	4.25		119.9	69.9 71.4	8,382		0.192		1
								24,291	
	4.75		122.9	72.9	8,960		0.206	26,494	8
3 (100+1/2WQCV)	5.00		124.4	74.4	9,256		0.212	28,771	
	5.25	16.0	125.9	75.9	9,556	10101	0.219	31,123	
	5.50		127.4	77.4	9,861		0.226	33,550	
	5.75		128.9	78.9	10,171	ness seeks	0.233	36,054	
	6.00	Sec.	130.4	80.4	10,485		0.241	38,636	
	6.25	KILL-SOK	131.9	81.9	10,803	Ser Sides	0.248	41,296	
	6.50	1.10.10.00	133.4	83.4	11,126		0.255	44,038	
	6.75	1000	134.9	84.9	11,453		0.263	46,860	
	7.00	1 States and the	136.4	86.4	11,785	193130.00	0.271	49,765	-
	7.25	Constanting of	137.9	87.9	12,122		0.278	52,753	-
	7.50		139.4	89.4	12,122	100 Marca	0.278	55,826	-
	7.50	1000	139.4	89.4	12,463		0.296	58,985	+
		Charles and							-
	8.00		142.4	92.4	13,158	-	0.302	62,230	-
	8.25		143.9	93.9	13,513		0.310	65,564	-
	8.50		145.4	95.4	13,872	6125255	0.318	68,987	
	8.75		146.9	96.9	14,235	2674	0.327	72,500	
	9.00	1202.02	148.4	98.4	14,603	Tes pert	0.335	76,105	L
	9.25	Plane and	149.9	99.9	14,975	20000	0.344	79,802	
	9.50		151.4	101.4	15,352		0.352	83,593	
	9.75	14 States	152.9	102.9	15,734		0.361	87,479	
	10.00	010200	154.4	104.4	16,120	ulg hatel	0.370	91,460	
	10.25	1150570	155.9	105.9	16,510	1000	0.379	95,539	1
	10.50		157.4	107.4	16,905	10000000	0.388	99,716	\vdash
	10.75		158.9	108.9	17,305		0.397	103,992	+
	11.00		160.4	110.4	17,708		0.407	108,368	+
	11.25		161.9	111.9	18,117		0.416	112,847	t
	11.50		163.4	111.9	18,117		0.416	117,427	+
	11.75		164.9	113.4	18,530		0.425	117,427	-
	12.00		164.9	114.9	18,947		0.435	122,112	+
	12.00		167.9	117.9	19,309		0.445	120,901	+
	12.50		169.4	119.4	20,227		0.464	136,799	+
	12.50		170.9	120.9	20.662	The second	0.464	141,910	+
	13.00		172.4	122.4	21,102 21,546		0.484	147,131	-
	13.25	1.00	173.9	123.9	21,548		0.495	152,482	F
	13.50 13.75		175.4	125.4	21,995		0.505	157,904	-
	13.75		176.9	126.9	22,449		0.515	163,460	+
	14.25	1.55	179.9	129.9	23,369		0.536	174,914	
	14.50		181.4	131.4	23,836 24,308		0.547	180,814	1
	14.75		182.9	132.9 134.4	24,308		0.558	186,832	-
		Concernance of			24,703	1000	0.000		-
								-	1
				-	-		-	-	-
				-	1			1	-
		1929.0.99				POR LE VEL			
		1000				100000	-	-	1
	-	-			-		-		+
		100000000		-	1	10000000			+
		POINT BAR				A LEBOOR	1.1		
				-					+
						2.715.75.0			+-
									-

Zone 1 Volume (WQCV) =	0.118	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.271	acre-feet
Zone 3 (100yr + 1 / 2 WQCV - Zones 1 & 2) =	0.267	acre-feet
Total Detention Basin Volume =	0.656	acre-feet
Initial Surcharge Volume (ISV) =	0	ft*3
Initial Surcharge Depth (ISD) =	0.33	ft
Total Available Detention Depth (Hetal) =	5.00	ft
Depth of Trickle Channel (H _{TC}) =	0.50	ft
Slope of Trickle Channel (STC) =	0.001	ft/ft
Slopes of Main Basin Sides (Smain) =	3	HV
Basin Length-to-Width Ratio (R _{L/W}) =	2	
Initial Surcharge Area (A _{sv}) =	0	R*2
Surcharge Volume Length (L _{5v}) =	0.3	ft
Surcharge Volume Width (Way) =	0.3	R
Depth of Basin Floor (H _{FLOOR}) =	0.10	R
Length of Basin Floor (L _{FLOOR}) =	99.9	ft
Width of Basin Floor (WFLOOR) =	50.0	
Area of Basin Floor (ArLoos) =	4,997	ft*2

 Amar of Bain F Forr (A₁₀₀)
 4.307
 m²

 Volume of Bain F Korr (V₁₀₀₀)
 106
 m²

 Depth of Main Bain (H₁₀₀)
 4.07
 n

 Length of Main Bain (H₁₀₀)
 4.07
 n

 With of Main Bain (H₁₀₀)
 4.07
 n

 With of Main Bain (H₁₀₀)
 2.026
 m²

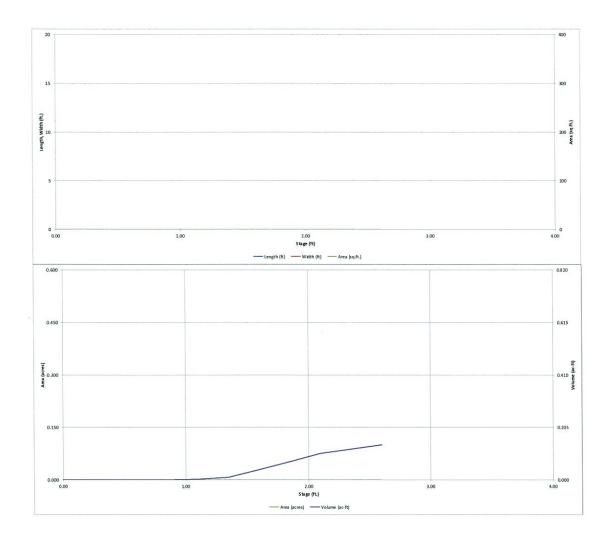
 Voltim of Main Bain (H₁₀₀)
 0.256
 m²

 Voltim of Main Bain (H₁₀₀)
 0.256
 m²

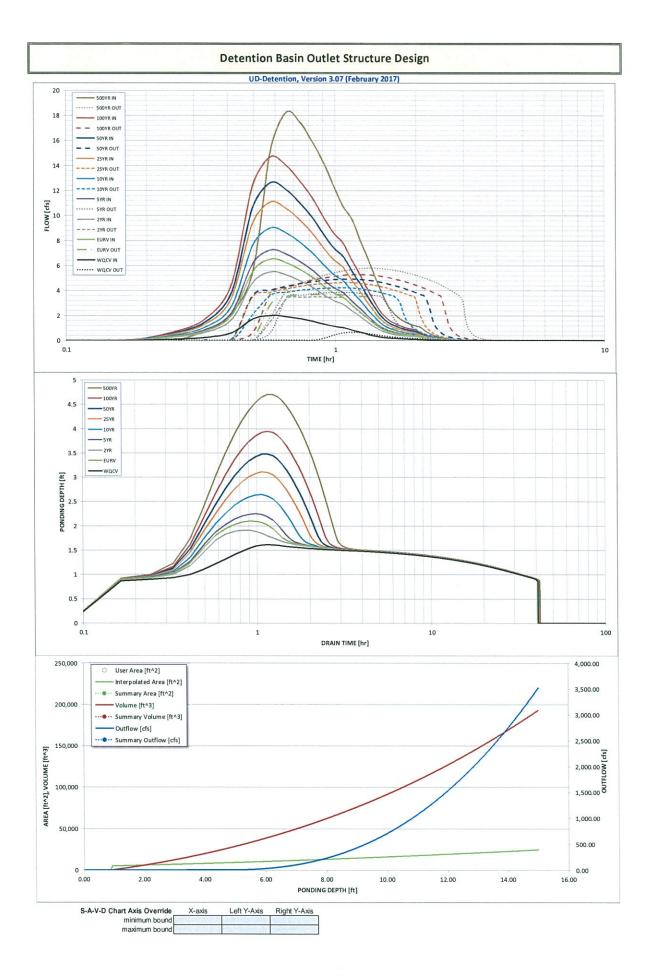
 bited Total Bain Volume (V₁₀₀)
 0.660
 acre-feet

Calcul

DETENTION BASIN STAGE-STORAGE TABLE BUILDER UD-Detention, Version 3.07 (February 2017)



		Deter	ntion Basin C	Juliet Structi	ire Design				
Project	s Academy Busines		UD-Detention, Ver	sion 3.07 (February	(2017)				
Basin ID:	the second s	scu				and the second second second			
ZONE 3									
ZONE 1				Stage (ft)	Zone Volume (ac-ft)	Outlet Type			
VOLUME EURY WOCY			Zone 1 (WQCV)	1.85	0.118	Orifice Plate			
	100-YEAR		Zone 2 (EURV)			Orifice Plate			
ZONE 1 AND 2-	ORIFICE			3.60	0.271				
P ENMANENT	Configuration (Rete	antion Pond)	; (100+1/2WQCV)	4.98	0.267	Weir&Pipe (Restrict)			
 (c) 1929 (million) (k) (c) 1929 (million) (k) (c) 1929 (million) (k) (c) 1929 (million) (k) 				l	0.656	Total		200000 - 200.	
ser Input: Orifice at Underdrain Outlet (typically u			- file et	()	Unde	and the second	d Parameters for Un		
Underdrain Orifice Invert Depth = Underdrain Orifice Diameter =		ft (distance below the inches	e intration media sur	lace)		rdrain Orifice Area = in Orifice Centroid =		ft ² feet	
Onderdrant Office Diameter -	N/A	inches			onderdia	in Office Centrold -	N/A	leet	
ser Input: Orifice Plate with one or more orifices	or Elliptical Slot Weir	(typically used to dra	in WOCV and/or EU	RV in a sedimentatio	n BMP)	Calcul	lated Parameters for	Plate	
Invert of Lowest Orifice =		ft (relative to basin b				ifice Area per Row =		ft ²	
Depth at top of Zone using Orifice Plate =		ft (relative to basin b				liptical Half-Width =		feet	
Orifice Plate: Orifice Vertical Spacing =		inches				tical Slot Centroid =		feet	
Orifice Plate: Orifice Area per Row =	0.31	sq. inches (diameter	= 5/8 inch)			Elliptical Slot Area =		ft ²	
ser Input: Stage and Total Area of Each Orifice F	ow (numbered from	lowest to highest)			417				
	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)	
Stage of Orifice Centroid (ft)	0.00	0.50	1.00	PROPERTY OF	Back Bank Inter			A PARAMAN AND A PARAMAN	
Orifice Area (sq. inches)	0.31	0.31	0.31	的建设建筑建筑建筑	MC ST SN STOR		an see same		
						_	-	-	
	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)	
Stage of Orifice Centroid (ft)									
Orifice Area (sq. inches)								Terris Contraction	
User Input: Vertical Orifice (Circ	ular or Poctangular)					Calculated	Parameters for Vert	tical Orifica	
User input. Vertical Office (City	Not Selected	Not Selected				Calculated	Not Selected	Not Selected	Ĩ.
Invert of Vertical Orifice =	N/A		ft (relative to basin b	oottom at Stage = 0 ft) v	ertical Orifice Area =	N/A	N/A	ft ²
Depth at top of Zone using Vertical Orifice =	N/A			oottom at Stage = 0 ft		al Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches	J.			L/		
User Input: Overflow Weir (Dropbox) and (irate (Flat or Sloped)					Calculated	Parameters for Ove	rflow Weir	
	Zone 3 Weir	Not Selected							
Overflow Weir Front Edge Height, Ho =	1.50	N/A					Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Length =			ft (relative to basin bo	ottom at Stage = 0 ft)	Height of Gr	ate Upper Edge, H _t =	1.50	Not Selected N/A	feet
	2.00	N/A	feet		Over Flow	Weir Slope Length =	1.50 2.00	N/A N/A	feet feet
Overflow Weir Slope =	0.00	N/A	feet H:V (enter zero for fl		Over Flow Grate Open Area /	Weir Slope Length = 100-yr Orifice Area =	1.50 2.00 4.87	N/A N/A N/A	feet should be ≥4
Overflow Weir Slope = Horiz. Length of Weir Sides =	0.00 2.00	N/A N/A	feet H:V (enter zero for fl feet	at grate)	Over Flow Grate Open Area / Overflow Grate Ope	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris =	1.50 2.00 4.87 2.80	N/A N/A N/A N/A	feet should be ≥ 4 ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % =	0.00 2.00 70%	N/A N/A N/A	feet H:V (enter zero for fl	at grate)	Over Flow Grate Open Area / Overflow Grate Ope	Weir Slope Length = 100-yr Orifice Area =	1.50 2.00 4.87	N/A N/A N/A	feet should be ≥ 4
Overflow Weir Slope = Horiz. Length of Weir Sides =	0.00 2.00 70%	N/A N/A	feet H:V (enter zero for fl feet	at grate)	Over Flow Grate Open Area / Overflow Grate Ope	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris =	1.50 2.00 4.87 2.80	N/A N/A N/A N/A	feet should be <u>></u> 4 ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % =	0.00 2.00 70% 50%	N/A N/A N/A N/A	feet H:V (enter zero for fl feet %, grate open area/t %	at grate)	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris =	1.50 2.00 4.87 2.80 1.40	N/A N/A N/A N/A N/A	feet should be ≥ 4 ft ² ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % =	0.00 2.00 70% 50%	N/A N/A N/A N/A ctor Plate, or Rectan	feet H:V (enter zero for fl feet %, grate open area/t %	at grate)	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris =	1.50 2.00 4.87 2.80 1.40	N/A N/A N/A N/A Flow Restriction Pla	feet should be ≥ 4 ft ² ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C	0.00 2.00 70% 50% Sircular Orifice, Restri Zone 3 Restrictor	N/A N/A N/A N/A ctor Plate, or Rectan Not Selected	feet H:V (enter zero for fl feet %, grate open area/1 % gular Orifice)	at grate) total area	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor	N/A N/A N/A N/A Flow Restriction Pla Not Selected	feet should be ≥ 4 ft ² ft ² te
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe =	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00	N/A N/A N/A tor Plate, or Rectan Not Selected N/A	feet H:V (enter zero for fl feet % grate open area/i % gular Orifice) ft (distance below bas	at grate)	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op ((Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area =	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58	N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A	feet should be \geq 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter =	0.00 2.00 70% 50% Sorcular Orifice, Restri Zone 3 Restrictor 0.00 18.00	N/A N/A N/A N/A ctor Plate, or Rectan Not Selected	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches	at grate) total area sin bottom at Stage = C	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op (((() ()))))))))))))	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid =	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A	feet should be ≥ 4 ft ² ft ² te
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe =	0.00 2.00 70% 50% Sorcular Orifice, Restri Zone 3 Restrictor 0.00 18.00	N/A N/A N/A tor Plate, or Rectan Not Selected N/A	feet H:V (enter zero for fl feet % grate open area/i % gular Orifice) ft (distance below bas	at grate) total area sin bottom at Stage = C	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op ((Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid =	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58	N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A	feet should be \geq 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sldes = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert =	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50	N/A N/A N/A N/A ctor Plate, or Rectan Not Selected N/A N/A	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches	at grate) total area sin bottom at Stage = C	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op (((() ()))))))))))))	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe =	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32 1.29	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A	feet should be \geq 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (O Depth to Invert of Outlet Pipe Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal)	N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches	at grate) total area sin bottom at Stage = C Half-i	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op (ft) Out Central Angle of Rest	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe =	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A	feet should be \geq 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sldes = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert =	0.00 2.00 70% 50% ircular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00	N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches	at grate) total area sin bottom at Stage = C Half-i	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O (((((((() () () () () ()	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calculat	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32 1.29 1.29	N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A Spillway	feet should be \geq 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages	0.00 2.00 70% 50% ircular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00	N/A N/A N/A N/A tor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches	at grate) total area sin bottom at Stage = C Half-i	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O ((((((() () () () () () (Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula r Design Flow Depth=	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 5 0.76	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A Spillway feet	feet should be \geq 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert st User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length =	0.00 2.00 70% 50% Srcular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 5.00 4.00	N/A N/A N/A N/A tor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches	at grate) total area sin bottom at Stage = C Half-i	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O ((((((() () () () () () (Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula r Design Flow Depth= at Top of Freeboard =	1.50 2.00 4.87 2.80 1.40 Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 0.76 6.76	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A Spillway feet feet	feet should be ≥ 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert s User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface =	0.00 2.00 70% 50% Strcular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 5.00 4.00 1.00	N/A N/A N/A N/A tor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches	at grate) total area sin bottom at Stage = C Half-i	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O ((((((() () () () () () (Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula r Design Flow Depth= at Top of Freeboard =	1.50 2.00 4.87 2.80 1.40 Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 0.76 6.76	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A Spillway feet feet	feet should be ≥ 4 ft ² ft ² te ft ²
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert s User Input: Emergency Spillway (Rectan Spillway Invert Stage: Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Routed Hydrograph Result:	0.00 2.00 70% 50% ircular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 1.00	N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches oottom at Stage = 0 f	at grate) total area sin bottom at Stage = C Half-1 t)	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O ((((() () () () () () () (Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula y Design Flow Depth= tt Top of Freeboard = tt Top of Freeboard =	1.50 2.00 4.87 2.80 1.40 Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 6.76 6.76 0.26	N/A N/A N/A N/A N/A Spillway feet feet acres	feet should be ≥ 4 ft ² ft ² te ft ² feet radians
Overflow Weir Slope = Horiz. Length of Weir Sloes = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert s User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Routed Hydrograph Result: Design Storm Return Period =	0.00 2.00 70% 50% Solution 2.00 Solution 2.00 2.00 2.00 3.00 5.00 5.00 4.00 4.00 5.	N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet H:V feet	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches oottom at Stage = 0 fl	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op ((ff) Out Central Angle of Rest Spillway Stage a Basin Area a	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula v Design Flow Depth= at Top of Freeboard = at Top of Freeboard =	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 0.76 6.76 0.26	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A Spillway feet feet feet acres	feet should be ≥ 4 ft ² ft ² te ft ² feet radians
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface =	0.00 2.00 70% 50% Sov Corcular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 4.00 0.00 4.00 5.00 4.00 5.00 4.00 5.00 4.00 5.00 4.00 5.00 4.00 5.00 5.00 4.00 5.00	N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches oottom at Stage = 0 f	at grate) total area sin bottom at Stage = C Half-1 t)	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate O ((((() () () () () () () (Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/ Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula y Design Flow Depth= tt Top of Freeboard = tt Top of Freeboard =	1.50 2.00 4.87 2.80 1.40 Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 6.76 6.76 0.26	N/A N/A N/A N/A N/A Spillway feet feet acres	feet should be ≥ 4 ft ² ft ² te ft ² feet radians
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = Ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert st User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Routed Hydrograph Result: Design Storm Return Period = One-Hour Rainfall Depth (in) = Calculated Ruroff Volume (acre-ft) =	0.00 2.00 70% 50% Some So	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet H:V feet EURV 1.07 0.389	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 fl 2 Year 1.19 0.327	at grate) total area sin bottom at Stage = 0 Half-1 t) <u>5 Year</u> <u>1.50</u> 0.431	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op ((ft) Out Central Angle of Rest Spillway Stage a Basin Area a 10 Year 1.75 0.538	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula y Design Flow Depth= at Top of Freeboard = at Top of Freeboard = 25 Year 2.00 0.662	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w// Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 0.76 6.76 0.26	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A Spillway feet feet acres 100 Year 2.52 0.880	feet should be ≥ 4 ft ² ft ² feet radians
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = Ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Routed Hydrograph Result: Design Storm Return Period = One-Hour Rainfall Depth (inj Calculated Runoff Volume (acre-ft) = OPTIONAL Override Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) =	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 4.00 0.53 0.118 0.118	N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin I feet H:V feet EURV 1.07 0.389	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 ff 2 Year 1.19 0.327	at grate) total area sin bottom at Stage = 0 Half-1 t) <u>5 Year</u> <u>1.50</u> 0.431	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op ((ft) Out Central Angle of Rest Spillway Stage a Basin Area a 10 Year 1.75 0.538	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcul : t Top of Freeboard = t Top of Freeboard = t Top of Freeboard = 25 Year 2.00 0.662	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 3 0.76 6.76 6.76 0.26	N/A N/A N/A N/A N/A Flow Restriction Pla N/A N/A N/A N/A Spillway feet feet feet acres	feet should be ≥ 4 ft ² ft ² feet radians 500 Year 3.01 1.098 1.097
Overflow Weir Slope = Horiz. Length of Weir Slope = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Treeboard above Max Water Surface = Cone-Hour Rainfall Depth (in) = Calculated Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Predevelopment Unit Peak Flow, q (Csfacre) =	0.00 2.00 70% 50% ircular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 1.00 WQCV 0.53 0.118 0.018 0.00	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet H:V feet URV 1.07 0.389 0.388 0.00	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 fl 2 Year 1.19 0.327	at grate) total area sin bottom at Stage = 0 Half-1 t) <u>5 Year</u> 1.50 0.431 0.431 0.02	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op (ft) Out Central Angle of Rest Spillway Stage a Basin Area a 1.75 0.538 0.20	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula: r Design Flow Deptha tt Top of Freeboard = tt Top of Freeboard = tt Top of Freeboard = 25 Year 2.00 0.662 0.67	1.50 2.00 4.87 2.80 1.40 Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 6.76 6.76 6.76 0.26 SO Year 2.25 0.757	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	feet should be ≥ 4 ft ² ft ² ft ² feet radians 500 Year 3.01 1.098 1.097 1.77
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = Ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Routed Hydrograph Result: Design Storm Return Period = One-Hour Rainfall Depth (in) = Calculated Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Predevelopment Unit Peak Flow, q (cfs/acre) = Predevelopment Unit Peak Closs =	0.00 2.00 70% 50% ircular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 1.00 5.00 0.118 0.118 0.018 0.018 0.00 0.0	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin I feet H:V feet EURV feet EURV 1.07 0.389 0.00 0.0	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 fl 2 Year 1.19 0.327	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.02 0.1	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op Overflow Grate Op (fit) Out Central Angle of Rest Spillway Stage a Basin Area a 10 Year 1.75 0.538 0.537 0.20 0.9	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula v Design Flow Depth= at Top of Freeboard = 25 Year 2.00 0.662 0.662 0.67 3.1	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w// Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 3 0.76 6.76 0.26 50 Year 2.25 0.757	N/A N/A N/A N/A N/A Flow Restriction Pla Not Selected N/A N/A N/A N/A Spillway feet feet feet acres 100 Year 2.52 0.880 0 0.879 1.25 5.7	feet should be ≥ 4 ft ² ft ² feet radians 1.098 1.097 1.77 8.1
Overflow Weir Slope = Horiz. Length of Weir Slope = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Treeboard above Max Water Surface = Cone-Hour Rainfall Depth (in) = Calculated Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Predevelopment Unit Peak Flow, q (Csfacre) =	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 1.00 5.00 4.00 0.53 0.118 0.118 0.018 0.00 2.0	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet H:V feet URV 1.07 0.389 0.388 0.00	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 fl 2 Year 1.19 0.327	at grate) total area sin bottom at Stage = 0 Half-1 t) <u>5 Year</u> 1.50 0.431 0.431 0.02	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op (ft) Out Central Angle of Rest Spillway Stage a Basin Area a 1.75 0.538 0.20	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula: r Design Flow Deptha tt Top of Freeboard = tt Top of Freeboard = tt Top of Freeboard = 25 Year 2.00 0.662 0.67	1.50 2.00 4.87 2.80 1.40 Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 6.76 6.76 6.76 0.26 SO Year 2.25 0.757	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	feet should be ≥ 4 ft ² ft ² ft ² feet radians 1.098 1.097 1.77
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = Ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Routed Hydrograph Result: Design Storm Return Period = One-Hour Rainfail Depth (in) = Calculated Runoff Volume (acreft) = Inflow Hydrograph Volume (acreft) = Predevelopment The Rei Q (cfs) = Peak Inflow Q (cfs) = Peak Outflow Q (cfs) = Peak Outflow Q (cfs) =	0.00 2.00 70% 50% Some So	N/A N/A N/A N/A N/A Selected N/A N/A ft (relative to basin l feet H:V feet EURV 1.07 0.389 0.389 0.388 0.00 0.0 6.5 3.7 N/A	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below base inches inches bottom at Stage = 0 fl 2 Year 1.19 0.326 0.01 0.1 5.5 3.5 N/A	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.02 0.1 7.3 3.8 39.8	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op Overflow Grate Op (fit) Out Central Angle of Rest Spillway Stage a Basin Area a 0.538 0.538 0.20 0.9 9.0 4.2 4.5	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula y Design Flow Depth= t Top of Freeboard = 25 Year 2.00 0.662 0.67 3.1 11.1 4.6 1.5	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w// Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 3 0.76 6.76 0.26 50 Year 2.25 0.757 0.757 0.93 4.3 1.2.6 4.9 1.2	N/A N/A N/A N/A N/A N/A Not Selected N/A 0.879 1.25 5.7 14.7 5.3 0.9	feet should be ≥ 4 ft ² ft ² feet radians 1.098 1.097 1.77 8.1 1.8.2 5.8 0.7
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway Crest Length = One-Hour Rainfall Depth (in) = Calculated Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Predevelopment Unit Peak Now, q (ofs/acre) = Peak Inflow Q (ofs) = Peak Notflow Q (ofs) = Peak Notflow Q (ofs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 5.00 4.00 1.00 8 9 0.118 0.118 0.018 0.018 0.018 0.00 2.0 0.0 0.0 2.0 0.0 0.0 0.	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin I feet H:V feet EURV 1.07 0.389 0.0388 0.00 0.0 6.5 3.7 N/A Outlet Plate 1	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 fl 2 Year 1.19 0.327 0.326 0.01 0.1 5.5 3.5 3.5 N/A Outlet Plate 1	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.431 0.02 0.1 7.3 3.8 39.8 Outlet Plate 1	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op Overflow Grate Op ((ft) Out Central Angle of Rest Spillway Stage a Basin Area a 0.537 0.20 0.9 9.0 4.2 4.5 Outlet Plate 1	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula to pof Freeboard = to Top of Freeboard = 25 Year 2.00 0.662 0.662 0.67 3.1 11.1 4.6 1.5 Outlet Plate 1	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Cone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 3 0.76 0.76 0.26 50 Year 2.25 0.757 0.756 0.93 4.3 1.2.6 4.9 12 Outlet Plate 1	N/A 0.879 1.25 0.7 1.4.7 5.3 0.9 Outlet Plate 1	feet should be ≥ 4 ft ² ft ² ft ² feet radians 1.098 1.097 1.77 8.1 1.8.2 5.8 0.7 Outlet Plat
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = ser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = CORE-Hour Rainfall Depth (in) Calculated Runoff Volume (acreft) = Inflow Hydrograph Okume (acreft) = Inflow Hydrograph Volume (acreft) = Predevelopment Orace Routflow Q (cfs) = Peak Inflow Q (cfs) Peak Outflow Q (cfs) Ratio Peak Outflow to Predevelopment O Structure Controlling Flow: Max Velocity through Grate 1 (fps)	0.00 2.00 70% 50% Sov Sov 2 on 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 4.00 0.00 4.00 0.00 0.018 0.118 0.00 0.07 N/A Overflow Grate 1 0.19	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet H:V feet 0.388 0.00 0.0 0.388 0.00 0.0 0.388 0.00 0.0 0.0 0.5 3.7 N/A Outlet Plate 1 1.31	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 fl 2 Year 1.19 0.326 0.326 0.01 0.1 5.5 3.5 N/A Outlet Plate 1 1.23	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.02 0.431 0.02 0.1 7.3 3.8 39.8 Outlet Plate 1 1.4	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op Overflow Grate Op (ft) Out Central Angle of Rest Spillway Stage a Basin Area a Basin Area a 0.537 0.538 0.537 0.20 0.9 9.0 4.2 4.5 0.0 1.5	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calculat Design Flow Depth= at Top of Freeboard = top of Freeboard = 25 Year 2.00 0.662 0.662 0.67 3.1 11.1 4.6 1.5 Outlet Plate 1 1.6	1.50 2.00 4.87 2.80 1.40 Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 0.76 6.76 0.26 SO Year 2.25 0.757 O .756 0.93 4.3 12.6 4.9 1.2 Outlet Plate 1 1.7	N/A N/A N/A N/A N/A Not Selected Not Selected N/A Spillway feet feet acres 0.880 0.879 1.25 5.7 14.7 5.3 0.9 Outlet Plate 1 1.9	feet should be ≥ 4 ft ² ft ² ft ² feet radians 500 Year 3.01 1.098 1.097 1.77 8.1 1.8.2 5.8 0.7 Outlet Plate 2.0
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = User Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway Crest Length = OPTIONAL Override Runoff Volume (acre-ft) = OPTIONAL Override Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Predevelopment Unit Peak Row, q (ofs/acre) = Predevelopment Q is Peak Unflow Q (ofs) = Peak Nufflow Q (ofs) = Peak Outflow to Predevelopment Q is Structure Controlling Flow	0.00 2.00 70% 50% Some So	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin I feet H:V feet EURV 1.07 0.389 0.0388 0.00 0.0 6.5 3.7 N/A Outlet Plate 1	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below bas inches inches bottom at Stage = 0 fl 2 Year 1.19 0.327 0.326 0.01 0.1 5.5 3.5 3.5 N/A Outlet Plate 1	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.431 0.02 0.1 7.3 3.8 39.8 Outlet Plate 1	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op Overflow Grate Op ((ft) Out Central Angle of Rest Spillway Stage a Basin Area a 0.537 0.20 0.9 9.0 4.2 4.5 Outlet Plate 1	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula to pof Freeboard = to Top of Freeboard = 25 Year 2.00 0.662 0.662 0.67 3.1 11.1 4.6 1.5 Outlet Plate 1	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Cone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 3 0.76 0.76 0.26 50 Year 2.25 0.757 0.756 0.93 4.3 1.2.6 4.9 12 Outlet Plate 1	N/A 0.879 1.25 0.7 1.4.7 5.3 0.9 Outlet Plate 1	feet should be ≥ 4 ft ² ft ² ft ² feet radians 1.098 1.097 1.77 8.1 1.8.2 5.8 0.7 Outlet Plate
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = Iser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway Crest Length = Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Routed Hydrograph Result: Design Storm Return Period = One-Hour Rainfall Depth (in) = Calculated Runoff Volume (acreft) = OPTIONAL Override Runoff Volume (acreft) = Predevelopment Unit Peak Flow (cfs) = Predevelopment Peak Q (cfs) = Peak Inflow Q (cfs) = Peak Outflow (cfs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow : Max Velocity through Grate 1 (fps) = Max Velocity through Grate 1 (fps) =	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 1.00 5.00 0.18 0.118 0.118 0.018 0.018 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin I feet H:V feet LURV feet LURV feet 0.389 0.00 0.389 0.388 0.00 0.0 6.5 3.7 N/A Outlet Plate 1 1.31 N/A	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below base inches inches bottom at Stage = 0 fl 2 Year 1.19 0.326 0.01 0.326 0.01 0.1 5.5 3.5 N/A Outlet Plate 1 1.23 N/A	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.02 0.1 7.3 3.8 39.8 Outlet Plate 1 1.4 N/A	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op Overflow Grate Op (fit) Out Central Angle of Rest Spillway Stage a Basin Area a 0.537 0.538 0.537 0.20 0.9 9.0 4.2 4.5 Outlet Plate 1 1.5 N/A	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula v Design Flow Depth= at Top of Freeboard = 1000 0.662 0.662 0.67 3.1 11.1 4.6 1.5 Outlet Plate 1 1.6 N/A	1.50 2.00 4.87 2.80 1.40 7 s for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 3 0.76 6.76 0.26 50 Year 2.25 0.757 0.756 0.93 4.3 1.2.6 4.9 1.2 Outlet Plate 1 1.7 N/A	N/A Spillway feet feet acres 100 Year 2.52 0.879 1.25 5.7 14.7 5.3 0.9 Outlet Plate 1 1.9 N/A	feet should be ≥ 4 ft ² ft ² feet radians 1.098 1.097 1.77 8.1 1.8.2 5.8 0.7 Outlet Plate 2.0 N/A
Overflow Weir Slope = Horiz. Length of Weir Sides = Overflow Grate Open Area % = Debris Clogging % = Jser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert s User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length + Spillway Crest Length + Spillway End Slopes = Freeboard above Max Water Surface = C Routed Hydrograph Result: Design Storm Return Period = One-Hour Rainfall Depth (in) Calculated Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) = Predevelopment Unit Peak Flow, q (Cfs/acre) = Predevelopment PakQ (cfs) = Peak Inflow Q (cfs) = Peak Inflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q Structure Controlling Flow i Max Velocity through Grate 1 (fps) Max Velocity through Grate 2 (fps) Time to Drain 97% of Inflow Volume (hours) Time to Drain 97% of Inflow Volume (hours)	0.00 2.00 70% 50% ircular Orlfice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 4.00 1.00 WQCV 0.53 0.118 0.018 0.018 0.118 0.00 2.0 0.7 N/A Overflow Grate 1 0.19 N/A 38 40 1.61	N/A N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet H:V feet URV 1.07 0.389 0.00 0.0389 0.388 0.00 0.00 6.5 3.7 N/A Outlet Plate 1 1.31 N/A 33 38 2.10	feet H.V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below base inches inches bottom at Stage = 0 fl 2 Year 1.19 0.326 0.01 0.1 5.5 3.5 N/A Outlet Plate 1 1.23 N/A 39 1.91	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.02 0.1 7.3 3.8 39.8 Outlet Plate 1 1.4 N/A 32 38 2.25	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op Overflow Grate Op (ft) Out Central Angle of Rest Spillway Stage a Basin Area a Basin Area a 0.537 0.20 0.537 0.20 0.9 9.0 4.2 4.5 Outlet Plate 1 1.5 N/A 30 38 2.64	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula v Design Flow Depth= t Top of Freeboard = t Top of Freeboard = 1000000000000000000000000000000000000	1.50 2.00 4.87 2.80 1.40 7 5 or Outlet Pipe w// 2 one 3 Restrictor 0.58 0.32 1.29 ated Parameters for 1 0 .76 6.76 0.26 1 2 0 .75 0.757 1 0 .756 0.93 4.3 12.6 4.9 1 .2 0 .49 1 .2 0 .49 1 .2 0 .756 0 .93 4.3 12.6 4.9 1 .2 0 .140	N/A Spillway feet feet acres 0.879 1.25 5.7 14.7 5.3 0.9 Outlet Plate 1 1.9 N/A 25 36 3.94	feet should be ≥ 4 ft ² ft ² feet radians
Overflow Weir Slope = Horiz. Length of Weir Sldes = Overflow Grate Open Area % = Debris Clogging % = Jser Input: Outlet Pipe w/ Flow Restriction Plate (C Depth to Invert of Outlet Pipe = Outlet Pipe Diameter = Restrictor Plate Height Above Pipe Invert = User Input: Emergency Spillway (Rectan Spillway Invert Stages Spillway Crest Length = Spillway Crest Length = Spillway End Slopes = Freeboard above Max Water Surface = Calculated Runoff Volume (acreft) = Calculated Runoff Volume (acreft) = Inflow Hydorgraph Volume (acreft) = Predevelopment Unit Peak Flow, q (Cfs/acre) = Predevelopment Unit Peak Flow, q (Cfs/acre) = Peak Inflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q Structure Controlling Flow Max Velocity through Grate 1 (fps) Max Velocity through Grate 1 (fps) Time to Drain 99% of Inflow Volume (hours)	0.00 2.00 70% 50% Circular Orifice, Restri Zone 3 Restrictor 0.00 18.00 6.50 gular or Trapezoidal) 5.00 5.00 4.00 1.00 5.00 4.00 1.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 7.00 8.00 5.00 5.00 7.00 8.00 5.00 7.000 7.00	N/A N/A N/A N/A Ctor Plate, or Rectan Not Selected N/A N/A ft (relative to basin l feet H:V feet EURV 1.07 0.389 0.00 0.388 0.00 0.0 0.388 0.00 0.0 0.5 3.7 N/A Outlet Plate 1 1.31 N/A 33 38	feet H:V (enter zero for fl feet %, grate open area/t % gular Orifice) ft (distance below base inches bottom at Stage = 0 fl 2 Year 1.19 0.327 0.326 0.01 0.1 5.5 3.5 N/A 0.0ttlet Plate 1 1.23 N/A 34 39	at grate) total area sin bottom at Stage = 0 Half-1 t) 5 Year 1.50 0.431 0.02 0.1 7.3 3.8 0.011ct Plate 1 1.4 N/A 32 38	Over Flow Grate Open Area / Overflow Grate Op Overflow Grate Op ((ff) Out Central Angle of Rest Spillway Stage a Basin Area a 0.537 0.20 0.9 9.0 4.2 4.5 0.0ttlet Plate 1 1.5 N/A 30 38	Weir Slope Length = 100-yr Orifice Area = en Area w/o Debris = pen Area w/o Debris = Calculated Paramete Outlet Orifice Area = let Orifice Centroid = rictor Plate on Pipe = Calcula to pof Freeboard = to Top of Freeboard = 100 - 0.662 0.662 0.662 0.67 3.1 11.1 4.6 1.5 Outlet Plate 1 1.6 N/A 28 37	1.50 2.00 4.87 2.80 1.40 rs for Outlet Pipe w/ Zone 3 Restrictor 0.58 0.32 1.29 ated Parameters for 3 0.76 6.76 0.26 0.757 0.757 0.756 0.93 4.3 1.2.6 4.9 1.2.6 4.9 1.2.6 0.04 1.7 N/A 27 36	N/A N/A N/A N/A N/A N/A Spillway feet feet 2.52 0.880 0.879 1.25 5.7 14.7 5.3 0.9 Outlet Plate 1 1.9 N/A	feet should be ≥ 4 ft ² ft ² ft ² feet radians



Detention Basin Outlet Structure Design Outflow Hydrograph Workbook Filename:

4.96 min 00 ydrograph 00 Constant 00 1.008 00 1008 00 000 00 011 11 11 11 12 2 2 2 2 2 2 2 2 2 2 2 2 2 <t< th=""><th>TIME D:00:00 D:01:00 D:04:58 D:09:55 D:14:53 D:19:50 D:24:48 D:09:46 D:39:41 D:44:38 D:49:36 D:54:34 D:59:31 1:04:38 D:59:31 1:04:29 1:09:26 1:14:24 1:19:22 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:44:10 D:59:02 2:04:00 2:08:58 2:13:55 2:23:50 2:28:48 2:38:43 2:43:41</th><th>WQCV [cfs] 0.00 0.00 0.00 0.09 0.24 0.63 1.73 2.01 1.91 1.74 1.54 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02</th><th>EURV [cfs] 0.00 0.00 0.29 0.78 2.01 5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.22 0.51 0.45 0.41 0.38 0.22 0.15 0.15 0.11 0.08 0.05</th><th>2 Year [cfs] 0.00 0.00 0.25 0.66 1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.32 0.17 0.12 0.09 0.06</th><th>5 Year [cfs] 0.00 0.00 0.32 0.87 2.23 6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12</th><th>10 Year [cfs] 0.00 0.00 0.00 0.40 1.08 2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28 0.21</th><th>25 Year [cfs] 0.00 0.00 0.49 1.32 3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.78 0.79 0.78 0.79 0.78</th><th>50 Year [cfs] 0.00 0.00 0.56 1.50 3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.54 0.40</th><th>100 Year [cfs] 0.00 0.00 0.05 1.74 4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 3.06 3.0</th><th>500 Year [cf. 0.00 0.00 0.00 0.80 2.16 5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80 0.58</th></t<>	TIME D:00:00 D:01:00 D:04:58 D:09:55 D:14:53 D:19:50 D:24:48 D:09:46 D:39:41 D:44:38 D:49:36 D:54:34 D:59:31 1:04:38 D:59:31 1:04:29 1:09:26 1:14:24 1:19:22 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:24:19 1:44:10 D:59:02 2:04:00 2:08:58 2:13:55 2:23:50 2:28:48 2:38:43 2:43:41	WQCV [cfs] 0.00 0.00 0.00 0.09 0.24 0.63 1.73 2.01 1.91 1.74 1.54 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02	EURV [cfs] 0.00 0.00 0.29 0.78 2.01 5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.22 0.51 0.45 0.41 0.38 0.22 0.15 0.15 0.11 0.08 0.05	2 Year [cfs] 0.00 0.00 0.25 0.66 1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.32 0.17 0.12 0.09 0.06	5 Year [cfs] 0.00 0.00 0.32 0.87 2.23 6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	10 Year [cfs] 0.00 0.00 0.00 0.40 1.08 2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28 0.21	25 Year [cfs] 0.00 0.00 0.49 1.32 3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.78 0.79 0.78 0.79 0.78	50 Year [cfs] 0.00 0.00 0.56 1.50 3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.54 0.40	100 Year [cfs] 0.00 0.00 0.05 1.74 4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 1.40 3.06 2.21 1.70 3.06 3.0	500 Year [cf. 0.00 0.00 0.00 0.80 2.16 5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80 0.58
Norm O ydrograph O Constant O 1.008 O 1.008 O 0.0 O 0.1 O 0.2 O 11 1 12 1 13 1 14 1 15 1 16 1 17 1 18 1 19 1 11 1 12 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 <th>10:04:58 0:09:55 0:14:53 0:19:50 0:24:48 0:09:41 0:34:43 0:44:38 0:44:38 0:44:38 0:44:38 0:44:38 0:44:38 0:44:38 0:49:41 0:59:31 1:04:29 1:04:29 1:124:19 1:29:17 1:29:17 1:34:14 1:39:12 1:44:10 1:45:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:28:48 2:33:46 2:38:43</th> <th>0.00 0.09 0.24 0.63 1.73 2.01 1.91 1.74 1.54 1.31 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.01</th> <th>0.00 0.029 0.78 2.01 5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05</th> <th>0.00 0.00 0.25 0.66 1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09</th> <th>0.00 0.00 0.32 0.87 2.23 6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.23 0.16 0.12</th> <th>0.00 0.00 0.40 1.08 2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.82 1.82 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28</th> <th>0.00 0.049 1.32 3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47</th> <th>0.00 0.00 0.56 1.50 3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.20 0.89 0.80 0.74 0.54 0.40</th> <th>0.00 0.00 0.65 1.74 4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47</th> <th>0.00 0.00 0.80 2.16 5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80</th>	10:04:58 0:09:55 0:14:53 0:19:50 0:24:48 0:09:41 0:34:43 0:44:38 0:44:38 0:44:38 0:44:38 0:44:38 0:44:38 0:44:38 0:49:41 0:59:31 1:04:29 1:04:29 1:124:19 1:29:17 1:29:17 1:34:14 1:39:12 1:44:10 1:45:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:28:48 2:33:46 2:38:43	0.00 0.09 0.24 0.63 1.73 2.01 1.91 1.74 1.54 1.31 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.01	0.00 0.029 0.78 2.01 5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.00 0.00 0.25 0.66 1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.00 0.00 0.32 0.87 2.23 6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.23 0.16 0.12	0.00 0.00 0.40 1.08 2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.82 1.82 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	0.00 0.049 1.32 3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	0.00 0.00 0.56 1.50 3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.20 0.89 0.80 0.74 0.54 0.40	0.00 0.00 0.65 1.74 4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	0.00 0.00 0.80 2.16 5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
vdrograph 00 Constant 0: 1.008 0: 1.008 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 11: 1: 12: 1: 13: 1: 14: 1: 15: 1: 16: 1: 17: 1: 18: 1: 11: 1: 12: 2: 2: 2: 2: 2: 2: 2: 2: 2: 2: 2: 1	b:09:55 b:14:53 b:19:50 b:19:50 b:24:48 b:29:46 b:34:43 b:049:36 b:59:31 b:049:36 b:59:31 b:049:26 1:14:24 1:109:26 1:14:24 1:19:22 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:45:05 1:59:02 2:04:00 2:08:58 2:23:50 2:28:48 2:33:46 2:38:43	0.00 0.09 0.24 0.63 1.73 2.01 1.91 1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.01	0.00 0.29 0.78 2.01 5.54 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.45 0.45 0.28 0.28 0.28 0.28 0.21 0.38 0.28 0.21 0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.00 0.25 0.66 1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.00 0.32 0.87 2.23 6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.23 0.16 0.12	0.00 0.40 1.08 2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	0.00 0.49 1.32 3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	0.00 0.56 1.50 3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 0.89 0.80 0.74 0.54 0.40	0.00 0.65 1.74 4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	0.00 0.80 2.16 5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
Constant O: 1.008 0: 0:	b:14:53 b:19:50 b:19:50 b:22:448 b:22:448 b:22:448 b:22:448 b:22:448 b:22:448 b:22:448 b:23:431 b:34:43 b:44:38 b:10:42:39 1:12:41:19 1:22:17 1:34:14 1:39:12 1:44:10 1:49:07 1:59:02 2:04:00 2:08:58 2:13:55 2:28:48 2:33:46 2:38:43	0.09 0.24 0.63 1.73 2.01 1.91 1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.36 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02	0.29 0.78 2.01 5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.25 0.66 1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.32 0.37 2.23 6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.23 0.16 0.12	0.40 1.08 2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	0.49 1.32 3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	0.56 1.50 3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 0.89 0.80 0.74 0.54 0.40	0.65 1.74 4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	0.80 2.16 5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1.008 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 1: 1: 1: 2:	D:19:50 D:224:48 D:224:48 D:224:48 D:224:48 D:234:43 D:39:41 D:39:41 D:39:41 D:49:36 D:54:34 D:59:31 1:04:29 1:14:24 1:19:22 1:24:19 1:24:19 1:34:14 1:49:07 1:54:05 1:59:02 2:04:00 2:04:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.24 0.63 1.73 2.01 1.91 1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	0.78 2.01 5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.66 1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.87 2.23 6.14 7.25 6.91 6.91 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	1.08 2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	1.32 3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.05 0.89 0.78 0.78 0.70 0.65 0.47	1.50 3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	1.74 4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	2.16 5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 2: <	D:24:48 D:29:46 D:29:46 D:39:41 D:39:43 D:39:43 D:39:43 D:39:43 D:39:44 D:59:51 1:04:29 1:09:26 1:14:24 1:19:22 1:29:17 1:34:14 1:49:07 1:59:02 1:44:10 1:49:07 1:59:02 2:04:00 2:04:55 2:18:53 2:23:46 2:33:46 2:38:43	0.63 1.73 2.01 1.91 1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.01	2.01 5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.11 0.08 0.05	1.70 4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	2.23 6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	2.77 7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	3.39 9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	3.86 10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	4.48 12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	5.55 15.26 18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 1:	D:29:46 D:34:43 D:35:43 D:59:31 1:09:26 1:14:24 1:19:22 1:24:19 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:59:02 2:04:00 2:08:58 2:13:55 2:28:48 2:33:46 2:38:43	1.73 2.01 1.91 1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.08 0.02 0.02 0.02 0.02	5.54 6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	4.68 5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	6.14 7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	7.61 9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	9.32 11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	10.62 12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	12.31 14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	15.26 18.25 17.44 15.88 14.22 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 1:	0:34:43 0:39:41 0:49:36 0:49:36 0:59:31 1:04:29 1:09:26 1:14:24 1:19:22 1:24:19 1:29:17 1:24:19 1:29:17 1:34:14 1:39:12 1:34:10 1:44:10 1:44:10 1:44:10 1:44:05 1:59:02 2:08:58 2:13:55 2:23:50 2:28:48 2:33:46 2:38:43	2.01 1.91 1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	6.53 6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.055	5.50 5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	7.25 6.91 6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	9.02 8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	11.07 10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	12.63 12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	14.67 14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	18.25 17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
0: 0: 0: 0: 0: 0: 1:	0:39:41 0:44:38 0:49:36 0:59:31 1:04:29 1:09:26 1:14:24 1:19:22 1:24:19 1:29:17 1:24:12 1:24:13 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:28:48 2:33:46 2:38:43	1.91 1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	6.22 5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.45 0.45 0.28 0.28 0.20 0.15 0.11 0.08 0.05	5.24 4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	6.91 6.29 5.61 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	8.60 7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	10.57 9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	12.06 10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	14.01 12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	17.44 15.88 14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
0: 0: 0: 0: 1:	0:44:38 0:49:36 0:59:31 1:04:29 1:09:26 1:14:24 1:19:22 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:23:56 2:23:46 2:38:43	1.74 1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	5.66 5.04 4.34 3.79 3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.45 0.45 0.45 0.28 0.28 0.28 0.20 0.15 0.11 0.08 0.05	4.77 4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	6.29 5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.45 0.42 0.31 0.23 0.16 0.12	7.83 6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	9.62 8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.05 0.89 0.78 0.70 0.65 0.47	10.98 9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	12.76 11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	15.88 14.22 12.32 10.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
0: 0: 0: 1:	0:49:36 0:54:34 0:59:31 1:04:29 1:09:26 1:4:24 1:19:22 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:23:56 2:28:48 2:33:46 2:38:43	1.54 1.31 1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	5.04 4.34 3.79 3.43 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	4.24 3.65 3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	5.61 4.83 4.21 3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	6.98 6.02 5.25 4.76 3.92 3.19 2.45 1.82 1.03 0.84 0.72 0.63 0.57 0.57 0.52 0.38 0.28	8.59 7.42 6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	9.81 8.48 7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	11.41 9.87 8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	14.22 12.32 10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
0: 1:	0:59:31 1:04:29 1:09:26 1:14:24 1:19:22 1:24:19 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:54:05 2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	1.15 1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.02 0.01	3.79 3.43 2.81 2.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	3.19 2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	4.21 3.81 3.13 2.55 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	5.25 4.76 3.92 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	6.46 5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.78 0.70 0.65 0.47	7.39 6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	8.59 7.79 6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	10.71 9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	1:04:29 1:09:26 1:14:24 1:19:22 1:24:19 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	1.04 0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	3.43 2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.45 0.45 0.28 0.20 0.15 0.11 0.08 0.05	2.88 2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	3.81 3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.57 0.50 0.45 0.45 0.42 0.31 0.23 0.16 0.12	4,76 3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	5.86 4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.78 0.70 0.65 0.47	6.69 5.53 4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	7,79 6,45 5,28 4,09 3,06 2,21 1,70 1,40 1,19 1,04 0,94 0,86 0,63 0,47	9.71 8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	1:09:26 1:14:24 1:19:22 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:28:48 2:23:50 2:28:48 2:33:46 2:38:43	0.84 0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02	2.81 2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.45 0.45 0.45 0.28 0.28 0.20 0.15 0.11 0.08 0.05	2.36 1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	3.13 2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	3.92 3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	4.83 3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	5,53 4,52 3,49 2,61 1,89 1,46 1,20 1,02 0,89 0,80 0,74 0,54 0,40	6.45 5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	8.06 6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	1:14:24 1:19:22 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:28:48 2:23:50 2:28:48 2:38:43	0.67 0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.01	2.29 1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	1.92 1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	2.55 1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	3.19 2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	3.95 3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	4.52 3.49 2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	5.28 4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	6.61 5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	1:19:22 1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:23:50 2:28:48 2:33:46 2:38:43	0.50 0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.08 0.06 0.04 0.03 0.02 0.02 0.02	1.75 1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	1.46 1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	1.95 1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	2.45 1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	3.04 2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	3.49 2.61 1.89 1.46 1.20 0.89 0.80 0.74 0.54 0.40	4.09 3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	5.13 3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	1:24:19 1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:59:02 2:04:00 2:08:58 2:13:55 2:28:53 2:23:50 2:28:48 2:33:46 2:38:43	0.36 0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	1.29 0.94 0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	1.07 0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	1.44 1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	1.82 1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	2.27 1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	2.61 1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	3.06 2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	3.86 2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	1:29:17 1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:13:55 2:218:53 2:23:50 2:28:48 2:33:46 2:38:43	0.27 0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	0.94 0.73 0.60 0.51 0.45 0.45 0.28 0.20 0.15 0.11 0.08 0.05	0.78 0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	1.05 0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	1.32 1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	1.64 1.27 1.05 0.89 0.78 0.70 0.65 0.47	1.89 1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	2.21 1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	2.80 2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	1:34:14 1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:08 2:13:55 2:13:55 2:13:55 2:218:53 2:23:50 2:228:48 2:33:46 2:38:43	0.21 0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	0.73 0.60 0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.61 0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.82 0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	1.03 0.84 0.72 0.63 0.57 0.52 0.38 0.28	1.27 1.05 0.89 0.78 0.70 0.65 0.47	1.46 1.20 1.02 0.89 0.80 0.74 0.54 0.40	1.70 1.40 1.19 1.04 0.94 0.86 0.63 0.47	2.15 1.77 1.50 1.31 1.18 1.08 0.80
1: 1: 1: 1: 1: 1: 1: 1: 1: 2: 2: 2: 2: 2: 2: 2: 2: 2: 2	1:39:12 1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.17 0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	0.60 0.51 0.45 0.41 0.28 0.20 0.15 0.11 0.08 0.05	0.50 0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.67 0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	0.84 0.72 0.63 0.57 0.52 0.38 0.28	1.05 0.89 0.78 0.70 0.65 0.47	1.20 1.02 0.89 0.80 0.74 0.54 0.40	1.40 1.19 1.04 0.94 0.86 0.63 0.47	1.77 1.50 1.31 1.18 1.08 0.80
11 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	1:44:10 1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.15 0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02	0.51 0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.43 0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.57 0.50 0.45 0.42 0.31 0.23 0.16 0.12	0.72 0.63 0.57 0.52 0.38 0.28	0.89 0.78 0.70 0.65 0.47	1.02 0.89 0.80 0.74 0.54 0.40	1.19 1.04 0.94 0.86 0.63 0.47	1.50 1.31 1.18 1.08 0.80
1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	1:49:07 1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.13 0.12 0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	0.45 0.41 0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.38 0.34 0.32 0.23 0.17 0.12 0.09	0.50 0.45 0.42 0.31 0.23 0.16 0.12	0.63 0.57 0.52 0.38 0.28	0.78 0.70 0.65 0.47	0.89 0.80 0.74 0.54 0.40	1.04 0.94 0.86 0.63 0.47	1.31 1.18 1.08 0.80
1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	1:54:05 1:59:02 2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.11 0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	0.38 0.28 0.20 0.15 0.11 0.08 0.05	0.32 0.23 0.17 0.12 0.09	0.42 0.31 0.23 0.16 0.12	0.52 0.38 0.28	0.65 0.47	0.74 0.54 0.40	0.86 0.63 0.47	1.08 0.80
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2:04:00 2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.08 0.06 0.04 0.03 0.02 0.02 0.02 0.01	0.28 0.20 0.15 0.11 0.08 0.05	0.23 0.17 0.12 0.09	0.31 0.23 0.16 0.12	0.38 0.28	0.47	0.54 0.40	0.63 0.47	0.80
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2:08:58 2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.06 0.04 0.03 0.02 0.02 0.01	0.20 0.15 0.11 0.08 0.05	0.17 0.12 0.09	0.23 0.16 0.12	0.28		0.40	0.47	and some officers and the
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2:13:55 2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.04 0.03 0.02 0.02 0.02	0.15 0.11 0.08 0.05	0.12	0.16		0.35	1		0.58
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2:18:53 2:23:50 2:28:48 2:33:46 2:38:43	0.03 0.02 0.02 0.01	0.11 0.08 0.05	0.09	0.12	0.21				0.00
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3	2:23:50 2:28:48 2:33:46 2:38:43	0.02 0.02 0.01	0.08				0.26	0.29	0.34	0.43
2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3	2:28:48 2:33:46 2:38:43	0.02	0.05	0.06		0.15	0.19	0.22	0.25	0.32
2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	2:33:46 2:38:43	0.01		or a sufficient state of the second state of t	0.09	0.11	0.13	0.15	0.18	0.23
2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2:38:43	the second s		0.05	0.06	0.08	0.10	0.11	0.13	0.16
2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3			0.04	0.03	0.04	0.05	0.07	0.08	0.09	0.12
2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 5 5 5 5	2:45:41	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.08
2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2:48:38	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.05
2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2:53:36	0.00	0.00	0.01	0.00	0.00	0.01	0.02	0.02	0.02
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2:58:34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3:03:31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3:08:29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3:13:26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 3 3 3	3:18:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3:23:22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3:28:19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3:33:17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:38:14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:43:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:48:10 3:53:07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:53:07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:03:02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:08:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:12:58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:17:55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:22:53 4:27:50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:27:50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:37:46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:42:43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:47:41 4:52:38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:57:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:02:34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:07:31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:12:29 5:17:26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:22:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:27:22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:32:19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	E-27.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:37:17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:37:17 5:42:14 5:47:12		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Summary Stage-Area-Volume-Discharge Relationships The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically. The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition p

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]	
	(Restricted)						For best results, include the
Real Real Providence	AND PROSERV						stages of all grade slope
Veral States States	a la serie de la						changes (e.g. ISV and Floor)
	And the second						from the S-A-V table on Sheet 'Basin'.
的现在分子的 在10月1日							Sheet Busht.
							Also include the inverts of al
							outlets (e.g. vertical orifice,
							overflow grate, and spillway
							where applicable).
							_
							4
							-
							-
							-
							-
							-
							-
	S SECONDERVIC						-
							1
							1
							1
an a	Exceletions.						1
98 70 0 9 8 9 8 2 5 C							
St. 44 19 19 10 10							
的社会的目的目的目的目的	11日前市政治(11日)						
	E STORM STR						
							_
							_
							_
							-
							_
							-
							-
							-
							-
							-
							-
and share the	a and a second second						-
and the second	e meserenzen						1
	N AREA TO LEAD						7
民國法律法律部項保護	1) Providence (State)						
	de la serie de						
							_
							-
States and the							-
	4 22-23-23-25-25						_
							-
NEW STREET, ST							_
							_
							-
and the second second							
MALE PROVINCIAL AND A							
							-
A DESCRIPTION OF A DESCRIPTION							
The second providence	As the first second						
A CONCERNENT	AN ASSAULT AND AND AND A						

APPENDIX C

DESIGN CHARTS

and Use or Surface	Percent						Runoff Co	efficients	-				
haracteristics	Impervious	2-y	ear	5 - y	ear	10-1	/ear	25.5	ear	50-1	year	100-	year
		HSG A&B	HSG CAD	HSG ALB	KSG CLD	HSGA&B	HSG C&D	HSG A&B	HSG C&D	HSG ALB	HSG C&D	HSG A&B	HSG CED
usiness										<u> </u>	<u> </u>	l	
Commercial Areas	95	0.79	0.80	0,81	0.82	0.83	0.84	0.85	0.87	0.87	0.88	0.88	0.89
Nelghborhood Areas	70	0.45	0.49	0.49	0.53	0.53	0.57	0.58	0.62	0.60	0.65	0.62	0.68
lesidential												1	
1/8 Acre or less	65	0.41	0,45	0.45	0.49	0.49	0.54	0.54	0.59	0.57	0.62	0.59	0.65
1/4Acre	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	D.54	0.50	0.58
1/3 Acre	30	0.18	0.22	0.25	0.30	0.32	0.38	0.39	0.47	0.43	0.52	0.47	0.57
1/2 Acre	25	0.15	0.20	0.22	0.28	0.30	0.36	0.37	0.46	0.41	0,51	0.45	0.56
1 Acre	20	0.12	0.17	0.20	0.26	0.27	0.34	0.35	0.44	0,40	0.50	0.44	0.55
Industrial		-						-{		-	-	-	
Ught Areas	80	0.57	0.60	0.59	0,63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Неачу Агеаз	90	0.71	0.73	0,73	0,75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Parks and Cemeteries	7	0.05	0.09	0.12	0.19	0.20	0.29	0,30	0.40	0.34	0.46	0.35	0.52
Playgrounds	13	0.07	0.13	0,16	0.23	0.24	0.31	0.32	0.42	0.37	0.48	0.41	0.54
Railroad Yard Areas	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0,45	0.54	0.50	0,58
Undeveloped Areas		-						+				+	
Historic Flow Analysis-				1	-	-							
Greenbelts, Agriculture	2	0.03	0.05	0.09	0.16	0.17	0.26	0.26	0.38	0.31	0.45	0.36	0.51
Pasture/Meadow	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Forest	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Exposed Rock	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Offsite Flow Analysis (when janduse is undefined)		0.26	0.31	0.32	0.37	0,38	0.44	0.44	0.51	0.48	0.55	0.51	0.59
													_
Streets								0.94	0.94	0.95	0.95	0.96	0.90
Paved	100	0.89	0.89	0.90							_		-
Gravei	\$0	0.57	0,60	0.59	0,63	0.63	0.66	0.65	0,70	0,68	0.72		
Drive and Walks	100	0.89	0,89	0.90	0.90	0.92	0.92	2 0.94	0.94	0.95	0.99	0.96	0.9
Roofs	90	0.71						_		0.80	0.8	2 0.81	0.8
Lawns	0	0.02	_				0.2	5 0.25	0.37	7 0.30	0.4	4 0.3	0.5

Table 6-6. Runoff Coefficients for Rational Method(Source: UDFCD 2001)

•

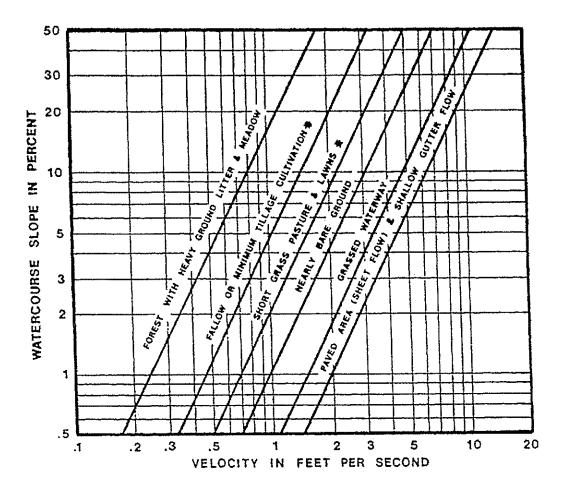


Figure 6-25. Estimate of Average Concentrated Shallow Flow

100

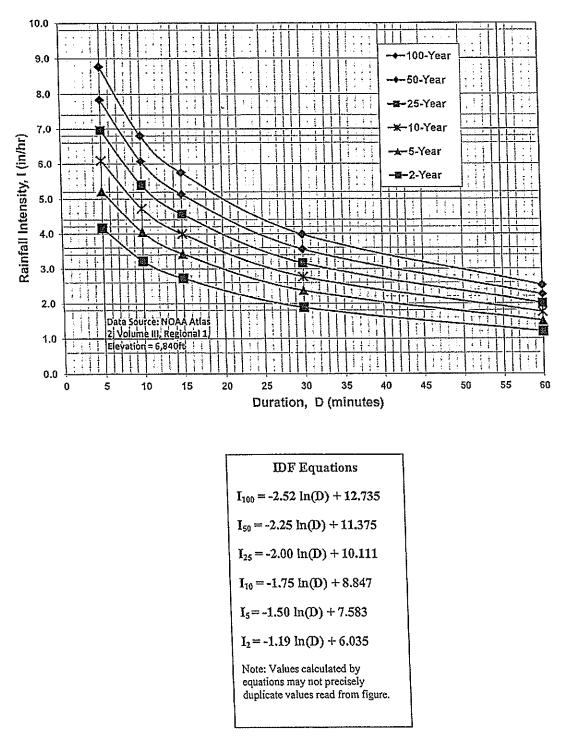
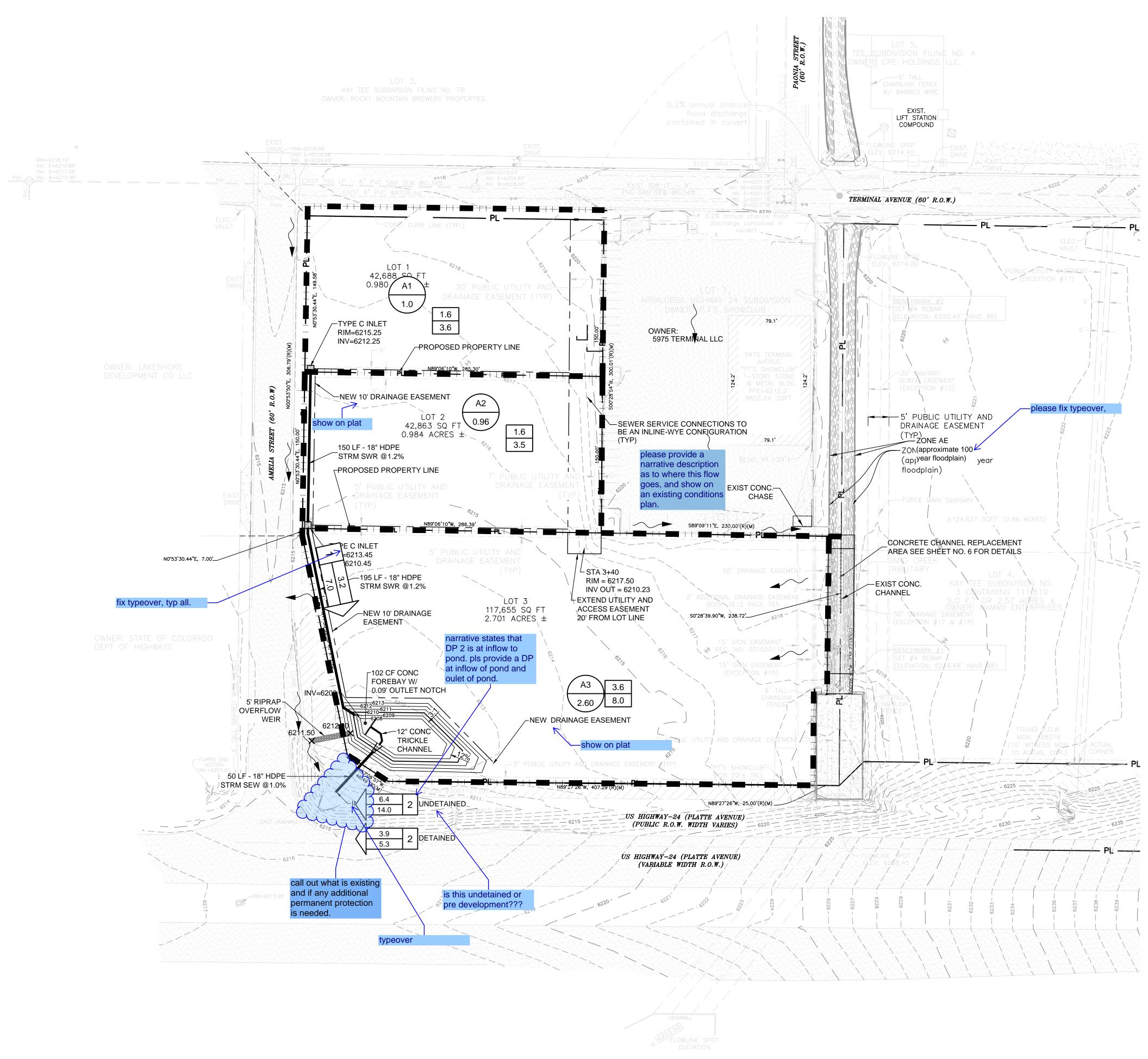
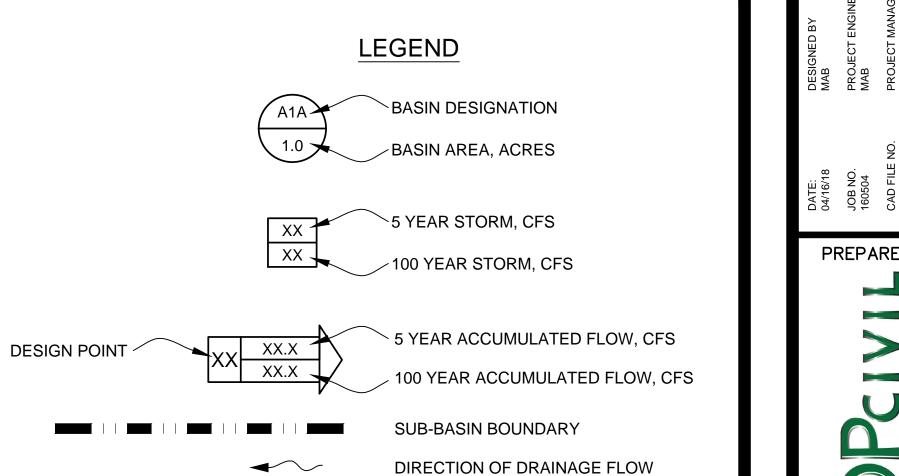


Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency





Please clearly show property boundaries. Please make ownership labels for adjacen parcels readable, as well as other items shaded back. Please call out who currently owns and maintains this channel.

 \checkmark

GRAPHIC SCALE (IN FEET) 1 inch = 50 ft.

APPALOOSA HIGHWAY 24 SUBDIVISION No. Date Revision BV FILING NO. 2 FILING NO. 2 COLORADO SPRINGS, COLORADO No. No. COLORADO SPRINGS, COLORADO Intervision Intervision No. DRAINAGE PLAN Intervision Intervision No.	DESIGNED BY	MAB	PROJECT ENGINEER	MAB	PROJECT MANAGER	MAR)	SCALE:	HORZ. 1" = 50'	VERT. N/A	
NOINAR ANALA DATA	DATE:	04/16/18	JOB NO.	100004		160504-Const		DRAWN BY	HJG		
NO. DATE REVISION		352 Colo		stin Su Sp 19)	Blue	uffs 1102 gs, 5-5:	Pa 200212	80		3	
ON DATE NO. DATE	BΥ										
NO	REVISION										
ZO	DATE										
APPALOOSA HIGHWAY 24 SUBDIVISION FILING NO. 2 COLORADO SPRINGS, COLORADO DRAINAGE PLAN	NO.										
	NOISIMULIS V& AVMIDIN VSOO IVDAV	NOICIVIDU 24 JOURINI AUDUNI AL JOURINA	ETITNIC NO 2	L'ILLING INC. 2			COLUNADO JI MINGJ, COLUNADO			DRAINAC'H PLAN	
-		S	S F	ł	F	, .	E	-	Г		
ЅҤЕЕТ		1		С	of			1			

Markup Summary

dsdgrimm (1)

in existing concrete channel is located on the east side of proposed

ite can be described as having a rapid permeability, medium-surfa h hazard of erosion. The soils within the site are Truckton sandy le ed as Hydrologic Group 'B'.

TATEMENT Map No. 08041C0754 F of the developed set is located within a designated FEMA 100-year information-rbublished in the Federal Emergency Management Age 80059C0754F, dated March 17, 1997, and LOMR 05-08-0368P date falls within the existing concrete channel.

DMPUTATION yy utilized for this report is in accordance with the City Drainage Cri \$ 1, dated May 2014. The Rational Method for computation of runof "Sub-Basin flows.

dsdnijkamp (33)

disturbance will only be 0.7 acres. Step 4: The development of this project will not aff The development of this site will have little impact constructed.

Please elaborate on the four step process, for example the use of the swales for step one, provide details Subject: Engineer Page Label: 3 Author: dsdgrimm Date: 8/15/2018 5:23:27 PM Color:

Subject: Engineer Page Label: 5 Author: dsdnijkamp Date: 8/16/2018 1:26:22 PM Color:

Please elaborate on the four step process. for example the use of the swales for step one. provide details for all four steps.

Map No. 08041C0754 F



Subject: Engineer Page Label: 23 Author: dsdnijkamp Date: 8/16/2018 1:45:31 PM Color:

Subject: Group Page Label: 23 Author: dsdnijkamp Date: 8/16/2018 1:48:08 PM Color: narrative states that DP 2 is at inflow to pond. pls provide a DP at inflow of pond and oulet of pond.

call out what is existing and if any additional permanent protection is needed.

2 UNDETAINED

Subject: Engineer Page Label: 23 Author: dsdnijkamp Date: 8/16/2018 1:48:58 PM Color:

is this undetained or pre development???

Subject: Engineer Page Label: 23 Author: dsdnijkamp Date: 8/16/2018 1:49:11 PM Color:

typeover

overed with rangeland grasses. The western toward the existing 4' x 4' box culvert under s vesterly toward the 4% 4' box culvert. An de of the lot, but no flows from this parcel ncrete channel has failed withother portions cfs for the 5-year storm and 6.3 cfs for the



Subject: Engineer Page Label: 3 Author: dsdnijkamp Date: 8/16/2018 1:51:14 PM Color:

Subject: Engineer

Author: dsdnijkamp

Date: 8/16/2018 1:53:31 PM

Page Label: 1

Color:

please call out on plan and call out Design point in text at this location for pre development and post development.

ease state when improvements will completed and who will maintain drainage and WQ structures, asse include who currently and in e future is responsible to maintain e concrete channel.



May 16, 2018

Subject: Engineer Page Label: 1 Author: dsdnijkamp Date: 8/16/2018 1:56:36 PM Color:

soncrete channel. A portion of the concrete channel has fai is of joint failure. sub-basin AEX produces flows of 0.8 cfs for the 5-year stor rm. where can 1 find a plan depicting this area? which area?



Subject: Engineer Page Label: 23 Author: dsdnijkamp Date: 8/16/2018 11:41:15 AM Color:

YP)

please provide a narrative description as to where this flow goes, and show on an existing conditions plan. Subject: Engineer Page Label: 23 Author: dsdnijkamp Date: 8/16/2018 11:44:40 AM Color:

please elaborate what this statement means, ie el contained, but flows to lot 3? divided into three (3) lots. Lots 1 and 2 will encompass 0.98 i

divided into three (3) lots. Lots 1 and 2 will encompass 0.98 a hass 2.7 acres. The proposed land is zoned 1-2 (Limited Indust ib self-fontained with all flows directed to an extended dete outhwest corner of Lot 3.

d in the northern portion of the site. Sub-basin A will produc

Subject: Engineer Page Label: 4 Author: dsdnijkamp Date: 8/16/2018 11:48:25 AM Color: Please state when improvements will be completed and who will maintain all drainage and WQ structures, please include who currently and in the future is responsible to maintain the concrete channel.

Drainage calculations have not been reviewed at this time. Due to the fact that the plan and the narrative have multiple discrepancies, please make corrections.

Reviewer reserves the right to make additional comments based on the volume of comments provided herein.

where can I find a plan depicting this area? what is the acreage of this basin?

Please clearly show property boundaries. Please make ownership labels for adjacent parcels readable, as well as other items shaded back. Please call out who currently owns and maintains this channel.

please provide a narrative description as to where this flow goes, and show on an existing conditions plan.

please elaborate what this statement means, ie elf contained, but flows to lot 3?

Subject: Engineer Page Label: 4 Author: dsdnijkamp Date: 8/16/2018 11:48:46 AM Color: Subject: Engineer proposed Page Label: 4 ll encompass 0.98 acres I-2 (Limited Industrial). Author: dsdnijkamp to an extended detention Date: 8/16/2018 11:49:09 AM ^_proposed Color: basin A will produce flows se flows will continue serty line. The flows will of the site. An 18" HDPE Subject: Engineer sub-basin designations should match Page Label: 4 sub-basin designa should match pla plan. Author: dsdnijkamp DEVELOPED DRAINAGE CONDITIONS The developed site will be divided into th each and Lot 3 will encompass 2.7 arcs.⁷ Drainage from each lot will be self-contain basin (EDB) facility in the southwest corn Date: 8/16/2018 11:50:33 AM Color: Lot 1, Sub-basin A, is located in the norther of 1.6 cfs for the 5-year storm and 3.5 cfs Subject: Engineer doesn't match plan. Page Label: 4 doesn't match plan. Author: dsdnijkamp leveloped site will be divided into three (3) lots. and Lot 3 will encompass 2.7 acres. The propose age from each lot will be self-contained with all (EDB) facility in the southwest corner of Lot 3. Date: 8/16/2018 11:50:57 AM Color: Sub-basin A, is located in the parthern portion ofs for the 5-year storm and 3.5 cfs for the 100-and be intercepted by a proposed swale located .y mile. The nows ' Subject: Engineer lot he site. An 18" HI Page Label: 4 Author: dsdnijkamp 1 lot Date: 8/16/2018 11:51:38 AM Color: 'oduce flows of 1. Subject: Engineer ed swale located along the p through Page Label: 4 C' inlet at the southwest corn Author: dsdnijkamp vs into Lot 2. Date: 8/16/2018 11:52:00 AM through Color: enter of the site. Sub-basin B ie 100-year storm. As with Lo the property line. These flow with all flows directed t Subject: Engineer of Lot 3 southerly southerly Page Label: 4 Author: dsdnijkamp Date: 8/16/2018 11:52:42 AM portion of the site. Sub-t Color: the 100-year storm. The e located along the prop t the southwest corner of

southerly

basis (120) facility in the surface sources of Let 3 Let 1, Sub-March A, bit source 1 the non-term particle of 1.6 cfs for the 5-year term and 3.5 cfs for the 100 such and be interpreted by a regression while local density of the travely one to a proposed symbolic constraints of the interpreted by a regression in Let 2. Let 2. Sub-Basis and the surface of the surface of the interpreted by a wavele local dal and gas of the party 1 $^{\circ}$ inter state of the surface of the surface of the surface interpreted by a wavele local dal and gas for party 1 $^{\circ}$ inter state by a wavele local dal and gas for party 1 $^{\circ}$ interpreted by a wavele local dal and gas for party 1 $^{\circ}$ interpreted by 100 feet on other or other to the later at the southwest corner of the bit These for hearts. At 10^{\circ} 100 feet on other or other to the later at the southwest corner of the southwest corner of the 2.5 cfs and 1.6 cf suscervity. Note that the pretent data 2.5 cfs and 1.6 cf suscervity. Note the pretent bit and 2.5 cfs and 1.6 cf suscervity. Note that the pretent bit is a state of the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest corner of the southwest pretent bits and the southwest pret Subject: Engineer Page Label: 4 Author: dsdnijkamp Date: 8/16/2018 11:53:04 AM Color:

Subject: Engineer

Page Label: 4 Author: dsdnijkamp

Color:

Color:

Left 2, Sub-senit & in incredient in the center of the starks set interrepting by a weak-located in the perpertury line. The stark set is t

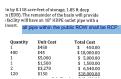
III produce nows ed swale located into the basin at see comment on plan re: DP2 ' box culvert to

The combined flows into the basin at 100-year storm.

nto the existing 4' x 4' box culvert to torm. outflow of pond should be labeled as a DP (3) Il need to be removed and replaced. we concrete channel section will be

> AD NUTS UF Outlet Structure UF A Energency Spillway EA Type C Inlet EA Concrete Channel LF asse state who owns and maintains the crotete channel, and confirm that you have

hannel will need to be removed and replaced. eep. The new concrete channel section will be ich remain





Subject: Engineer Page Label: 4 Author: dsdnijkamp Date: 8/16/2018 12:54:26 PM Color:

Subject: Engineer Page Label: 23 Author: dsdnijkamp Date: 8/16/2018 12:55:09 PM Color:

see comment on plan re: DP2

.....

outflow of pond should be labeled as a DP (3)

please state who owns and maintains the concrete channel, and confirm that you have an easement to work on the entire width of the channel.

all pipe within the public ROW shall be RCP.

fix typeover, typ all.

Subject: Engineer Page Label: 4 Author: dsdnijkamp Date: 8/16/2018 12:48:21 PM

Date: 8/16/2018 12:47:23 PM

Subject: Engineer

Page Label: 4 Author: dsdnijkamp Date: 8/16/2018 12:49:01 PM Color:

Subject: Engineer Page Label: 4 Author: dsdnijkamp

Author: dsdnijkamp Date: 8/16/2018 12:50:47 PM Color: doesn't match plan

ninoor

