JPS ENGINEERING
19 E. Willamette Ave.
Colorado Springs, CO 80903
(719)-477-9429
www.jpsengr.com

October 7, 2026

El Paso County Planning and Community Development Department
2880 International Circle
Colorado Springs, CO 80910

Add a statement acknowledging that the WQCV drain time is less than originally designed.

SUBJECT: Clearway, Lot 5 (PPR-22-034)
Engineer's Certification Letter – Permanent Control Measures

Ladies and Gentlemen:

Drainage Permanent Control Measures (PCM's) for this project include one private Sand Filter Detention Basin. The PCM(s) provide the required storage volume and meet the required release rates, storage areas, elevations, and outlet dimensions, as documented by the attached revised MHFD-Detention spreadsheet that shows the as-built conditions. The As-Built drawings accurately depict the installation of the PCM improvements and verify that adequate detention volume has been provided.

Based upon information gathered from periodic site visits to the project, JPS Engineering, Inc. is of the opinion that the Permanent Control Measures have been constructed in general compliance with the approved design plans as filed with El Paso County.

The site and adjacent properties (as affected by work performed under the County permit) appear to be stable with respect to settlement and subsidence, sloughing of cut and fill slopes, revegetation or other ground cover, and the improvements (public improvements, common development improvements, site grading and paving) meet or exceed the minimum design requirements.

Sincerely,
JPS Engineering, Inc.



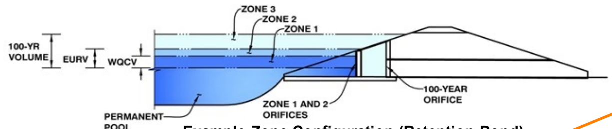
John P. Schwab, P.E.
Colorado P.E. No. 29891

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: Clearway - Lot 5

Basin ID: Pond 1 - As-Built



Example Zone Configuration (Retention Pond)

Revise tributary area to include east edge of site. See comment on ASB for more information.

Watershed Information

Selected BMP Type =	**SF**	
Watershed Area =	2.15	acres
Watershed Length =	335	ft
Watershed Length to Centroid =	165	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	85.60%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	12.0	hours
Location for 1-hr Rainfall Depths =	Denver - Capitol Building	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.053	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	0.247	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.161	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.52 in.) =	0.212	acre-feet	1.52	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	0.246	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	0.289	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	0.331	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	0.378	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	0.484	acre-feet		inches
Approximate 2-yr Detention Volume =	0.162	acre-feet		
Approximate 5-yr Detention Volume =	0.214	acre-feet		
Approximate 10-yr Detention Volume =	0.251	acre-feet		
Approximate 25-yr Detention Volume =	0.297	acre-feet		
Approximate 50-yr Detention Volume =	0.323	acre-feet		
Approximate 100-yr Detention Volume =	0.347	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.053	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.194	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.100	acre-feet
Total Detention Basin Volume =	0.347	acre-feet

Depth Increment = ft

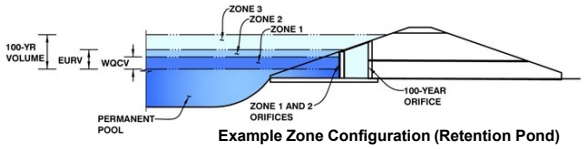
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Media Surface	--	0.00	--	--	--	2,300	0.053		
EL=6252.0	--	0.50	--	--	--	3,583	0.082	1,471	0.034
	--	1.50	--	--	--	4,450	0.102	5,487	0.126
EL=6254.0	--	2.50	--	--	--	5,395	0.124	10,410	0.239
Berm EL=6256.0	--	4.50	--	--	--	7,700	0.177	23,505	0.540
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DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: **Clearway - Lot 5**

Basin ID: **Pond 1 - As-Built**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.73	0.053	Filtration Media
Zone 2 (EURV)	2.57	0.194	Rectangular Orifice
Zone 3 (100-year)	3.31	0.100	Weir&Pipe (Restrict)
Total (all zones)		0.347	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	3.32	ft (distance below the filtration media surface)	Underdrain Orifice Area =	0.0	ft^2
Underdrain Orifice Diameter =	1.10	inches	Underdrain Orifice Centroid =	0.05	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Centroid of Lowest Orifice =	N/A	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	N/A	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	N/A	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	sq. inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	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)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	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)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Rectangular	Not Selected			Zone 2 Rectangular	Not Selected	
Invert of Vertical Orifice =	0.80	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	0.03	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	2.57	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	0.08	N/A	feet
Vertical Orifice Height =	2.00	N/A	inches				
Vertical Orifice Width =	2.50		inches				

Calculated Parameters for Vertical Orifice

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.36	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	2.36	N/A	feet
Overflow Weir Front Edge Length =	2.91	N/A	feet	Overflow Weir Slope Length =	2.91	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	47.82	N/A	
Horiz. Length of Weir Sides =	2.91	N/A	feet	Overflow Grate Open Area w/o Debris =	6.70	N/A	ft^2
Overflow Grate Type =	Close Mesh Grate	N/A		Overflow Grate Open Area w/ Debris =	3.35	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	3.46	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	0.14	N/A	ft^2
Outlet Pipe Diameter =	18.00	N/A	inches	Outlet Orifice Centroid =	0.12	N/A	feet
Restrictor Plate Height Above Pipe Invert =	2.40		inches	Half-Central Angle of Restrictor Plate on Pipe =	0.75	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	3.15	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.23 feet
Spillway Crest Length =	22.00	feet	Stage at Top of Freeboard =	4.38 feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.17 acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	0.52 acre-ft

Calculated Parameters for Spillway

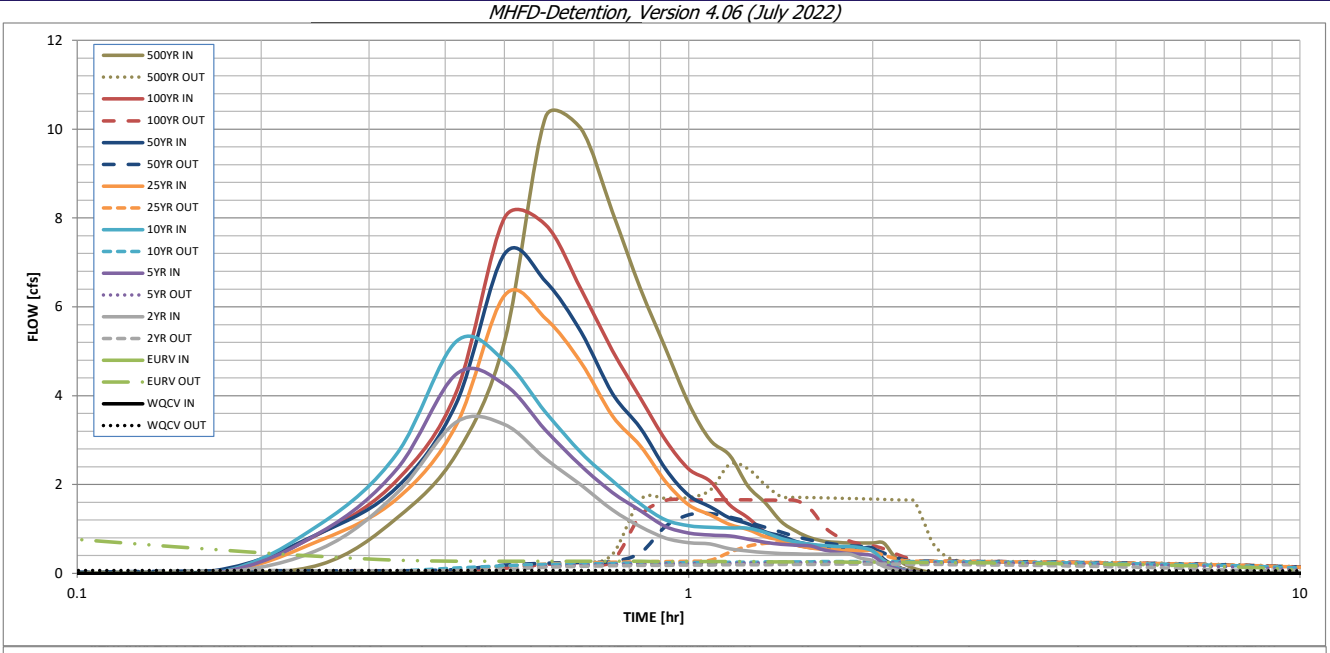
Routed Hydrograph Results

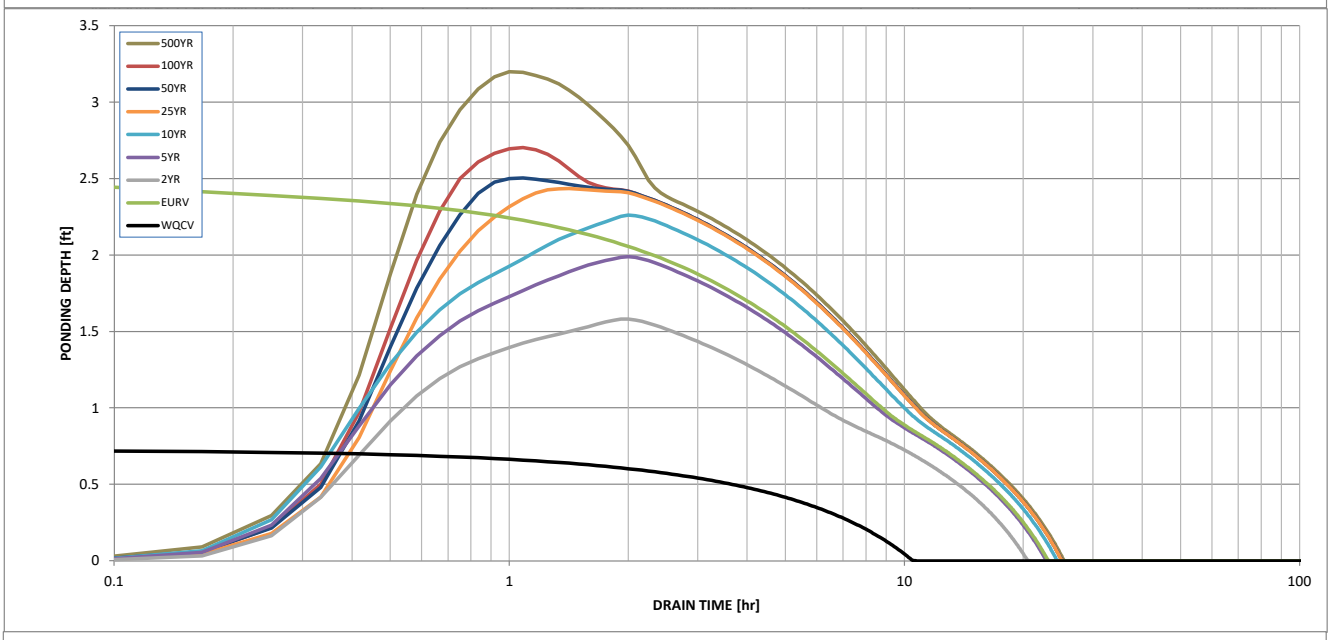
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

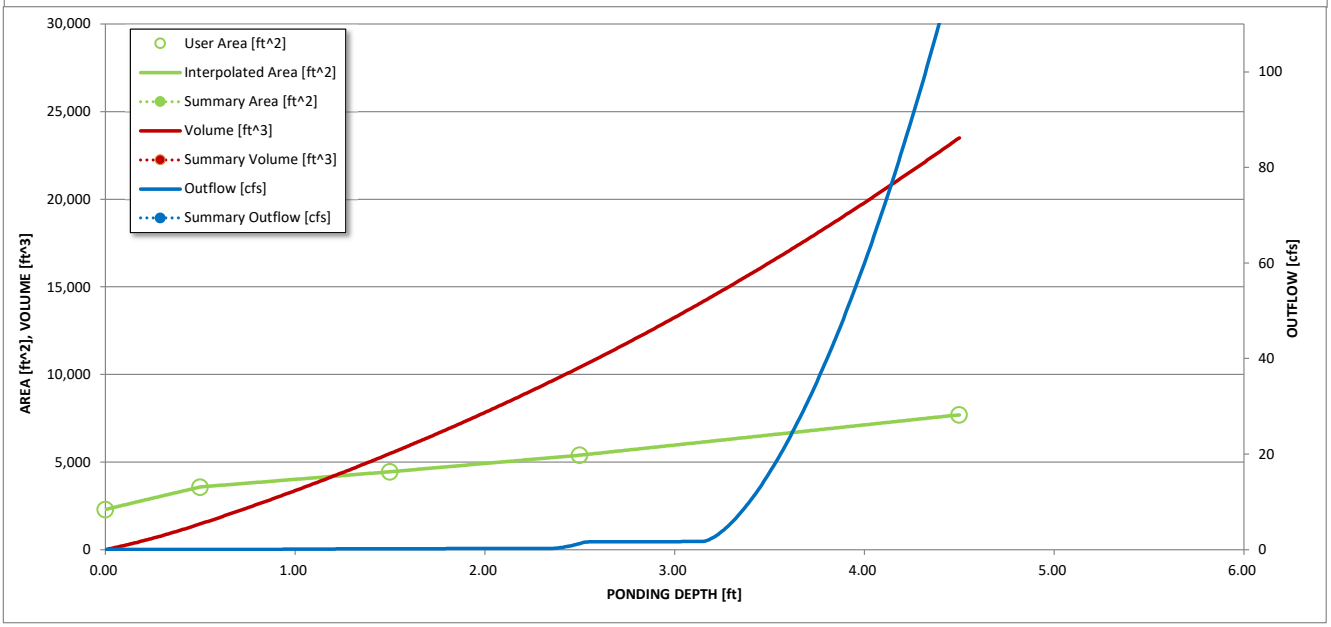
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.52	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.053	0.247	0.161	0.212	0.246	0.289	0.331	0.378	0.484
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.161	0.212	0.246	0.289	0.331	0.378	0.484
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.0	0.0	0.1	0.5	1.0	1.6	2.9
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.02	0.03	0.24	0.46	0.75	1.33
Peak Inflow Q (cfs) =	N/A	N/A	3.4	4.5	5.2	6.3	7.2	8.0	10.3
Peak Outflow Q (cfs) =	0.1	1.5	0.2	0.2	0.3	0.7	1.3	1.7	2.5
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	5.8	4.8	1.3	1.4	1.0	0.9
Structure Controlling Flow =	Filtration Media	Outlet Plate 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	0.20	N/A	N/A	N/A	0.1	0.2	0.2	0.2
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	10	22	20	22	23	23	23	23	22
Time to Drain 99% of Inflow Volume (hours) =	**10**	23	20	23	24	25	24	24	24
Maximum Ponding Depth (ft) =	0.73	2.57	1.58	1.99	2.26	2.44	2.50	2.70	3.20
Area at Maximum Ponding Depth (acres) =	0.09	0.13	0.10	0.11	0.12	0.12	0.12	0.13	0.14
Maximum Volume Stored (acre-ft) =	0.053	0.248	0.134	0.179	0.210	0.230	0.239	0.264	0.331

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.20
	0:15:00	0.00	0.00	0.56	0.93	1.12	0.75	0.92	0.91	1.25
	0:20:00	0.00	0.00	1.81	2.35	2.70	1.68	1.94	2.10	2.69
	0:25:00	0.00	0.00	3.41	4.49	5.23	3.34	3.84	4.09	5.24
	0:30:00	0.00	0.00	3.35	4.25	4.79	6.27	7.20	8.02	10.28
	0:35:00	0.00	0.00	2.58	3.23	3.63	5.74	6.57	7.85	10.01
	0:40:00	0.00	0.00	1.99	2.42	2.72	4.74	5.43	6.39	8.15
	0:45:00	0.00	0.00	1.43	1.83	2.09	3.55	4.06	5.02	6.42
	0:50:00	0.00	0.00	1.05	1.42	1.56	2.87	3.28	3.95	5.06
	0:55:00	0.00	0.00	0.80	1.06	1.21	2.06	2.35	3.00	3.83
	1:00:00	0.00	0.00	0.69	0.91	1.08	1.54	1.76	2.35	3.00
	1:05:00	0.00	0.00	0.66	0.86	1.04	1.32	1.50	2.08	2.66
	1:10:00	0.00	0.00	0.56	0.84	1.02	1.10	1.25	1.54	1.97
	1:15:00	0.00	0.00	0.50	0.77	1.02	0.99	1.12	1.25	1.59
	1:20:00	0.00	0.00	0.47	0.70	0.92	0.83	0.94	0.93	1.17
	1:25:00	0.00	0.00	0.45	0.66	0.79	0.75	0.85	0.75	0.95
	1:30:00	0.00	0.00	0.44	0.63	0.70	0.64	0.72	0.64	0.80
	1:35:00	0.00	0.00	0.43	0.62	0.66	0.57	0.65	0.58	0.72
	1:40:00	0.00	0.00	0.43	0.53	0.63	0.54	0.61	0.56	0.70
	1:45:00	0.00	0.00	0.43	0.48	0.61	0.52	0.59	0.55	0.69
	1:50:00	0.00	0.00	0.43	0.45	0.61	0.51	0.58	0.55	0.69
	1:55:00	0.00	0.00	0.34	0.43	0.58	0.51	0.57	0.55	0.69
	2:00:00	0.00	0.00	0.29	0.40	0.51	0.51	0.57	0.55	0.69
	2:05:00	0.00	0.00	0.16	0.22	0.29	0.29	0.33	0.31	0.39
	2:10:00	0.00	0.00	0.09	0.13	0.16	0.16	0.19	0.18	0.22
	2:15:00	0.00	0.00	0.04	0.07	0.08	0.09	0.10	0.09	0.12
	2:20:00	0.00	0.00	0.02	0.03	0.04	0.04	0.05	0.05	0.06
	2:25:00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02
	2:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00