El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Waterbury Filing No. 1 & 2

Owner name: 4-Way Ranch Joint Ventures

Location Address:

Stapleton Drive and Bandernero Drive Intersection Falcon, CO

Latitude and Longitude:

Lat: 38.969011, Long: -104.570362

Assessor's Parcel #: 4200000417 Section: 28 Township: 12 Range: 64

Expected Completion date: Winter 2022

Update date

GEC Plan states the project disturbes 68.7 ac. Verify area and update accordingly.

Project acreage: 61.88 Design Ponding Acres: 0.99 Design Storm: 100-Y

Design Engineer Email Address: quentin.armijo@tnesinc.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):

EDB POND 1

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. NA

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No. SF237

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Waterbury Filing No. 1 ~~& 2~~ EDB Pond 1 D8 8**

Facility Location & Jurisdiction: **Stapleton Dr. & Bandernero Dr Intersection**

User Input: Watershed Characteristics

Watershed Slope =	0.019	ft/ft
Watershed Length =	1250	ft
Watershed Area =	22.34	acres
Watershed Imperviousness =	51.9%	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

Location for 1-hr Rainfall Depths (use dropdown):

User Input

WQCV Treatment Method = Extended Detention

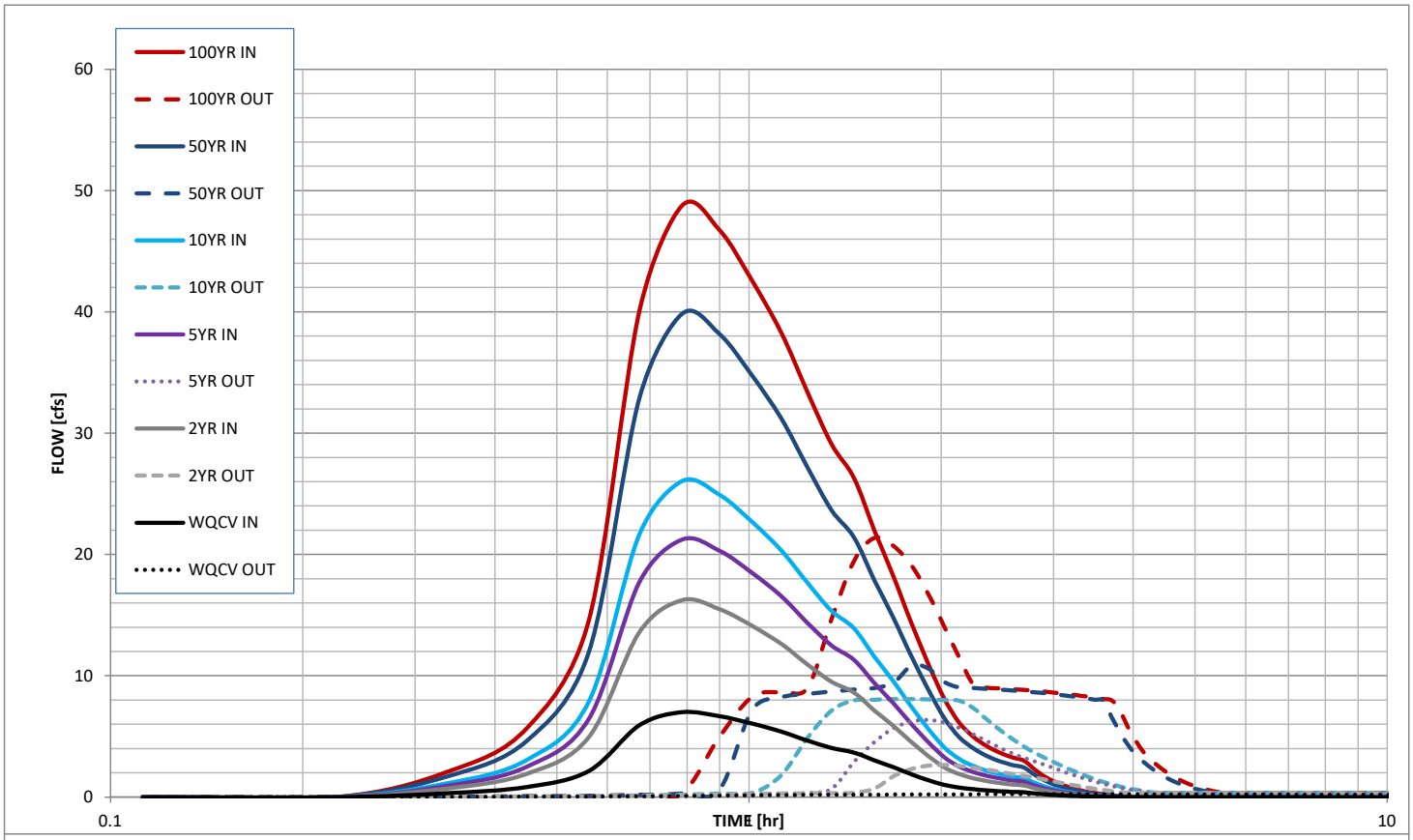
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	100	0.00	0.00
0.25	3,176	0.25	0.04
0.50	6,253	0.50	0.06
0.75	8,372	0.75	0.07
1.00	10,492	1.00	0.09
1.25	12,612	1.25	0.14
1.50	14,732	1.50	0.17
1.75	16,852	1.75	0.19
2.00	18,972	2.00	0.21
2.25	21,092	2.25	0.27
2.50	23,212	2.50	0.30
2.75	25,435	2.75	0.33
3.00	27,658	3.00	0.36
3.25	29,881	3.25	3.70
3.50	32,105	3.50	7.91
3.75	34,328	3.75	8.21
4.00	36,551	4.00	8.50
4.25	38,744	4.25	8.78
4.50	40,997	4.50	9.06
4.75	43,176	4.75	20.80
5.00	45,355	5.00	42.67
5.25	47,534	5.25	71.79
5.50	49,712	5.50	107.27
5.75	51,891	5.75	148.67
6.00	54,070	6.00	195.73
6.25	56,249	6.25	248.30
6.50	58,428	6.50	306.29

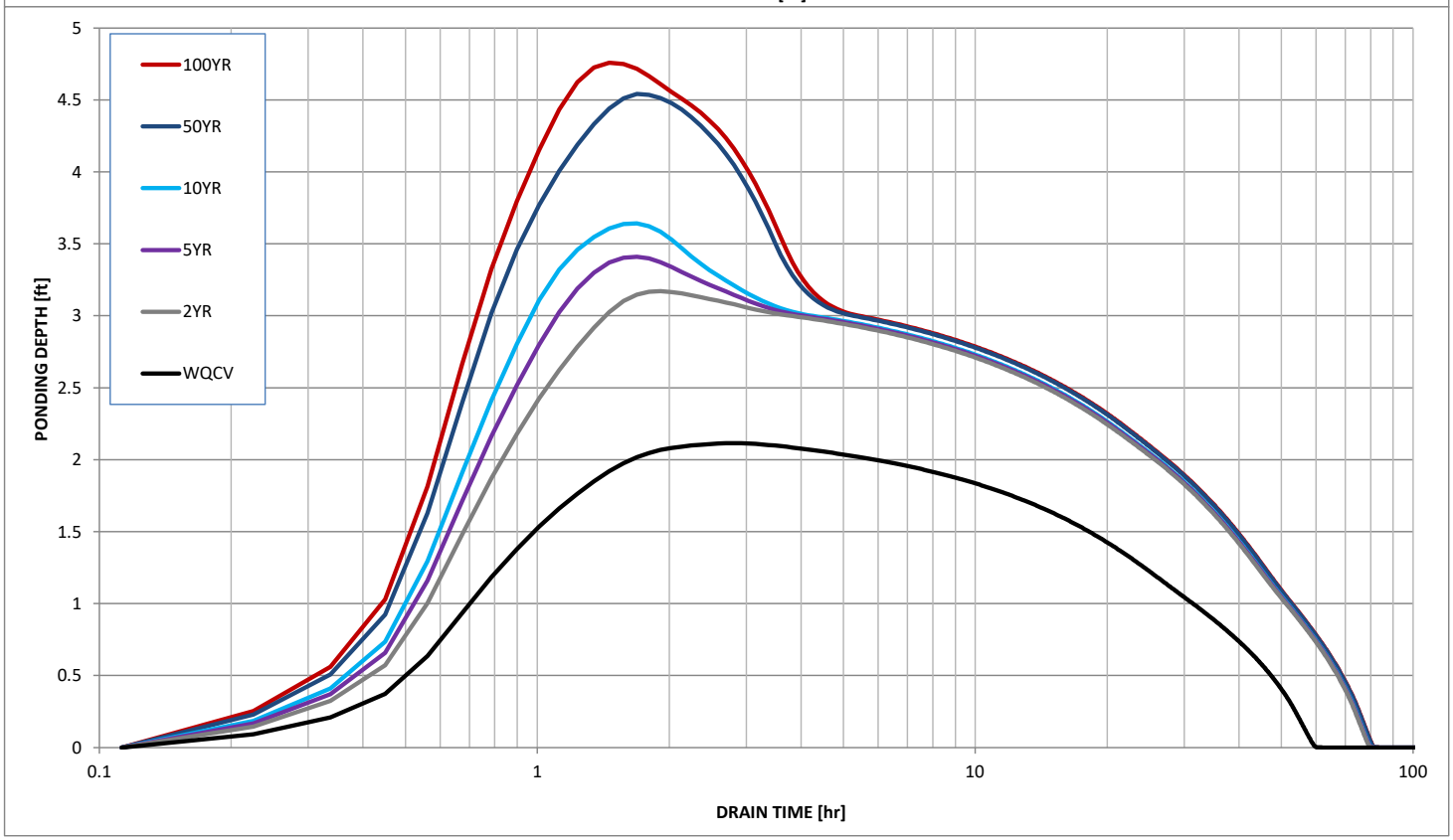
After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.19	1.50	1.75	2.25	2.52	in
Calculated Runoff Volume =	0.394	0.923	1.212	1.490	2.292	2.813	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.564	1.322	1.737	2.136	3.285	4.033	acre-ft
Time to Drain 97% of Inflow Volume =	51.7	66.5	**64.4**	62.4	57.5	54.4	hours
Time to Drain 99% of Inflow Volume =	55.2	72.6	71.7	70.9	69.3	**68.0**	hours
Maximum Ponding Depth =	2.11	3.17	3.41	3.64	4.54	4.76	ft
Maximum Ponded Area =	0.46	0.67	0.72	0.76	0.95	**0.99**	acres
Maximum Volume Stored =	0.520	1.112	1.281	1.450	2.219	2.434	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





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Project name: Waterbury Filing No. 1 ~~& 2~~

Owner name: 4-Way Ranch Joint Ventures

Location Address:

Stapleton Drive and Bandernero Drive Intersection Falcon, CO

Latitude and Longitude:

Lat: 38.971229, Long: -104.563163

Assessor's Parcel #: 4200000417 Section: 28 Township: 12 Range: 64

Expected Completion date: Winter 2022 — Update date

GEC Plan states the project disturbes 68.7 ac. Verify area and update accordingly.

Project acreage: 61.88 Design Ponding Acres: 0.65 Design Storm: 100-Y

Design Engineer Email Address: quentin.armijo@tnesinc.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):

EDB POND 2

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. NA

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

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O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No. SF237

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Waterbury Filing No. 1 ~~&2~~ EDB Pond 2 DP 18**

Facility Location & Jurisdiction: **Stapleton Dr. & Bandernero Dr Intersection**

User Input: Watershed Characteristics

Watershed Slope =	0.019	ft/ft
Watershed Length =	1050	ft
Watershed Area =	21.06	acres
Watershed Imperviousness =	25.8%	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

Location for 1-hr Rainfall Depths (use dropdown):

User Input

WQCV Treatment Method = Extended Detention

User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	100	0.00	0.00
0.25	942	0.25	0.02
0.50	1,784	0.50	0.03
0.75	2,626	0.75	0.04
1.00	3,468	1.00	0.04
1.25	5,034	1.25	0.07
1.50	6,600	1.50	0.09
1.75	8,166	1.75	0.10
2.00	9,732	2.00	0.11
2.25	11,297	2.25	0.14
2.50	12,863	2.50	0.16
2.75	14,429	2.75	0.17
3.00	15,995	3.00	0.18
3.25	19,602	3.25	3.05
3.50	23,209	3.50	10.28
3.75	26,815	3.75	10.76
4.00	30,422	4.00	11.17
4.25	34,029	4.25	11.57
4.50	37,636	4.50	11.96
4.75	41,243	4.75	12.33
5.00	44,850	5.00	12.70
5.25	48,650	5.25	20.77
5.50	52,450	5.50	35.88
5.75	56,251	5.75	56.20
6.00	60,051	6.00	81.25
6.25	63,851	6.25	110.80
6.50	67,652	6.50	144.75
6.75	71,452	6.75	183.06
7.00	75,252	7.00	225.73

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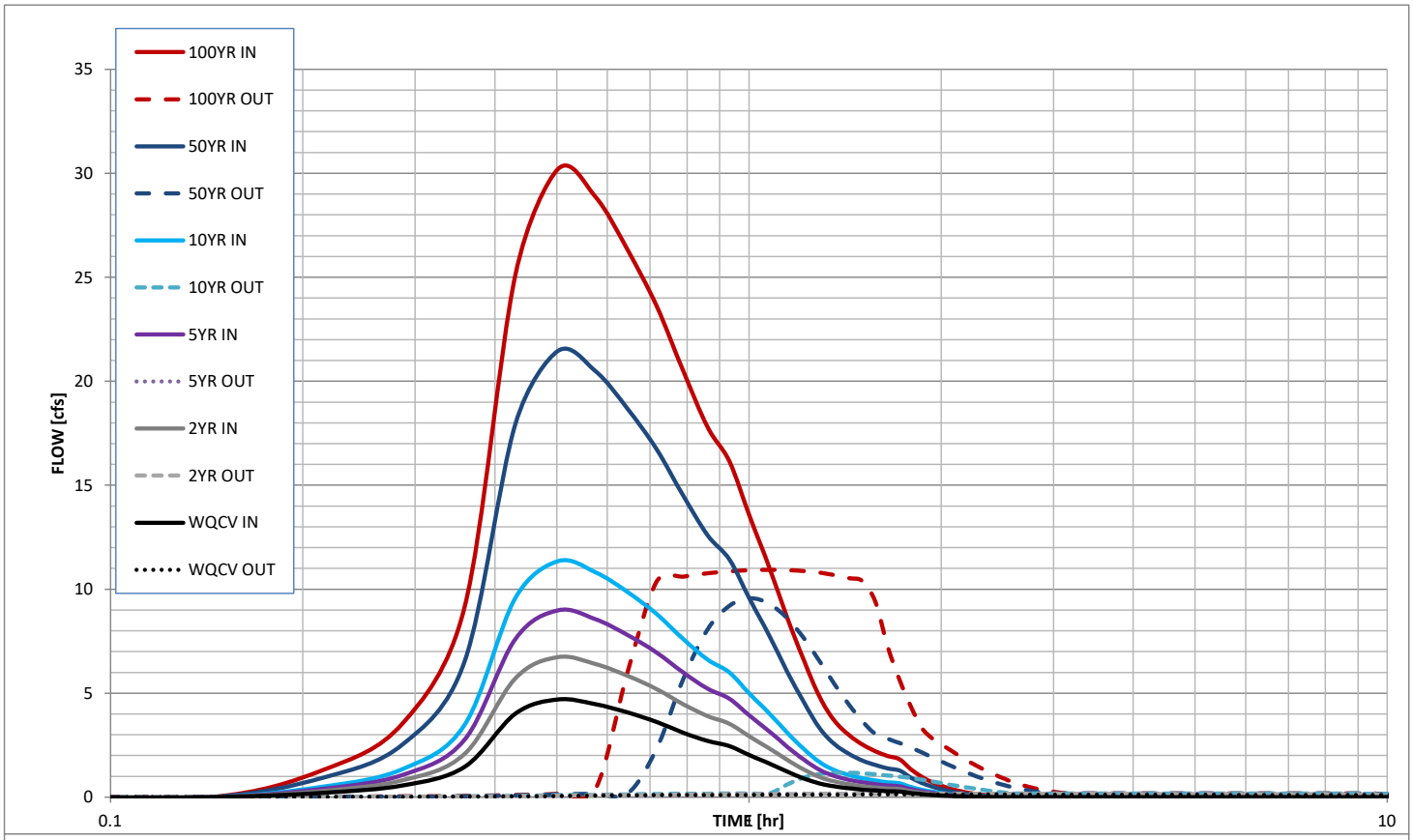
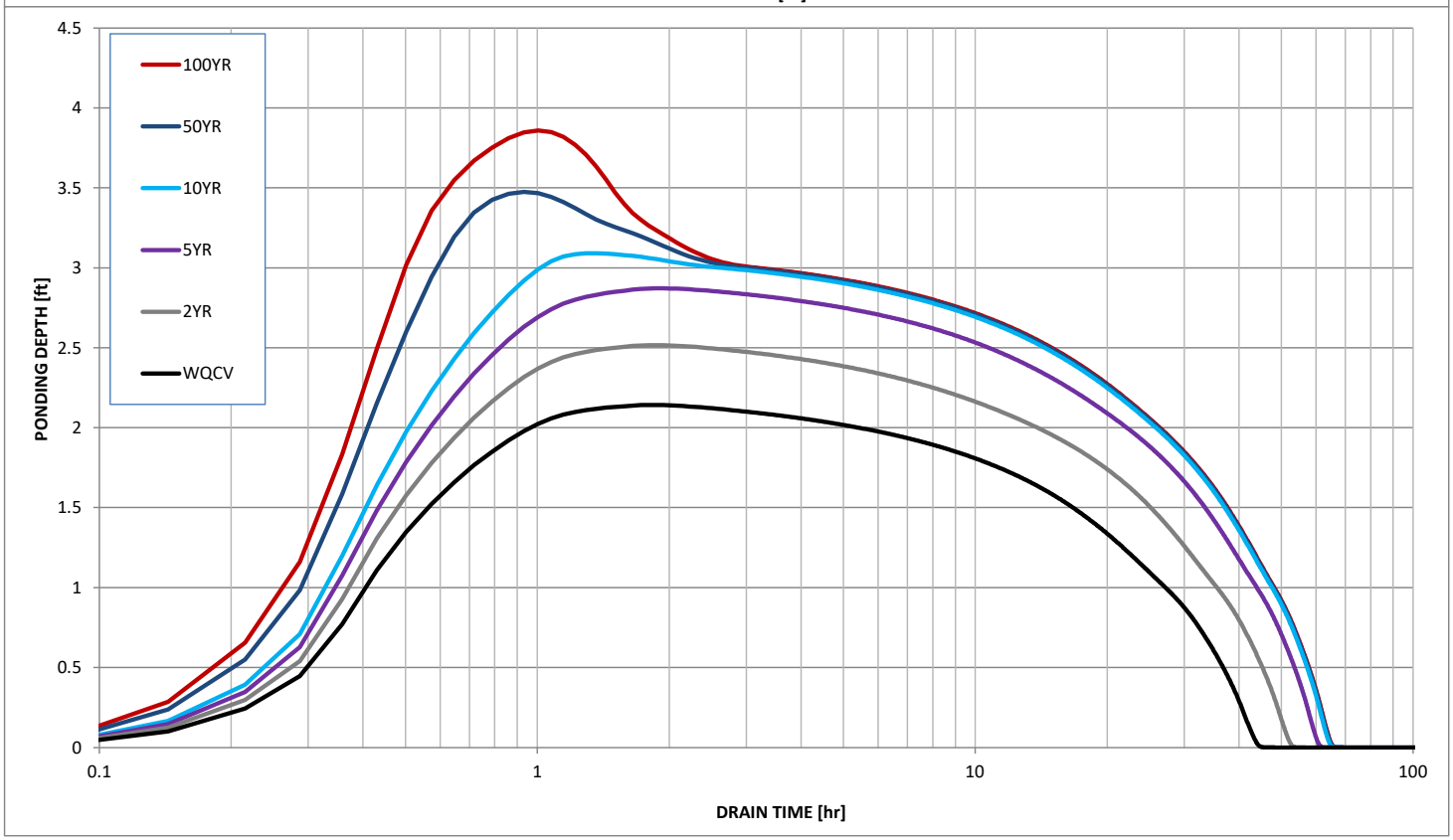
Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.19	1.50	1.75	2.25	2.52	in
Calculated Runoff Volume =	0.241	0.347	0.464	0.589	1.120	1.583	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.241	0.346	0.464	0.588	1.120	1.583	acre-ft
Time to Drain 97% of Inflow Volume =	38.4	45.5	**52.4**	54.7	50.2	46.4	hours
Time to Drain 99% of Inflow Volume =	41.0	48.8	56.5	59.5	57.5	**56.0**	hours
Maximum Ponding Depth =	2.14	2.52	2.87	3.09	3.48	3.86	ft
Maximum Ponded Area =	0.24	0.30	0.35	0.39	0.52	**0.65**	acres
Maximum Volume Stored =	0.224	0.326	0.439	0.520	0.695	0.923	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





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Project name: Waterbury Filing No. 1 ~~& 2~~

Owner name: 4-Way Ranch Joint Ventures

Location Address:

Stapleton Drive and Bandernero Drive Intersection Falcon, CO

Latitude and Longitude:

Lat:38.972831, Long:-104.566933

Assessor's Parcel #: 4200000417 Section: 28 Township: 12 Range: 64

Expected Completion date: Winter 2022 Update date

GEC Plan states the project disturbes 68.7 ac. Verify area and update accordingly.

Project acreage: 61.88 Design Ponding Acres: 1.89 Design Storm: 100-Y

Design Engineer Email Address: quentin.armijo@tnesinc.com

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List all permanent water quality control measure(s) (EDBs, rain gardens, etc):

EDB POND 3

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. NA

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

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Review Engineer

EPC Project File No. SF237

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Waterbury Filing No. 1 ~~& 2~~ EDB Pond 3 DP 29**

Facility Location & Jurisdiction: **Stapleton Dr. & Bandernero Dr Intersection**

User Input: Watershed Characteristics

Watershed Slope =	0.022	ft/ft
Watershed Length =	1900	ft
Watershed Area =	82.44	acres
Watershed Imperviousness =	49.0%	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

Location for 1-hr Rainfall Depths (use dropdown):

User Input

WQCV Treatment Method = Extended Detention

User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	100	0.00	0.00
0.25	2,785	0.25	0.10
0.50	5,470	0.50	0.14
0.75	8,155	0.75	0.18
1.00	10,840	1.00	0.20
1.25	13,525	1.25	0.23
1.50	16,210	1.50	0.25
1.75	18,895	1.75	0.37
2.00	21,580	2.00	0.43
2.25	26,334	2.25	0.48
2.50	31,088	2.50	0.53
2.75	35,842	2.75	0.57
3.00	40,596	3.00	0.60
3.25	45,530	3.25	0.73
3.50	50,105	3.50	0.81
3.75	54,895	3.75	0.87
4.00	59,613	4.00	0.93
4.25	62,301	4.25	0.98
4.50	64,989	4.50	1.03
4.75	67,677	4.75	4.39
5.00	70,365	5.00	14.71
5.25	73,504	5.25	28.91
5.50	75,742	5.50	46.13
5.75	78,430	5.75	60.71
6.00	81,118	6.00	62.35
6.25	82,113	6.25	74.47
6.50	83,503	6.50	111.77
6.75	84,696	6.75	163.81
7.00	85,888	7.00	227.74
7.25	87,081	7.25	302.17
7.50	88,274	7.50	386.27
7.75	89,466	7.75	479.48
8.00	90,659	8.00	581.41

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Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.19	1.50	1.75	2.25	2.52	in
Calculated Runoff Volume =	1.398	3.156	4.151	5.117	8.003	9.913	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	1.397	3.155	4.151	5.111	7.999	9.910	acre-ft
Time to Drain 97% of Inflow Volume =	41.7	61.8	**62.5**	61.0	56.7	54.1	hours
Time to Drain 99% of Inflow Volume =	44.2	66.4	68.1	67.6	65.8	**64.7**	hours
Maximum Ponding Depth =	3.12	4.47	4.88	5.15	5.77	6.26	ft
Maximum Ponded Area =	0.98	1.48	1.58	1.66	1.80	**1.89**	acres
Maximum Volume Stored =	1.316	3.019	3.647	4.089	5.164	6.075	acre-ft

Stormwater Detention and Infiltration Design Data Sheet