

Please remove the MS4 pages from this document since they are submitted as a separate item on EDARP.



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: The Hills at Lorson Ranch– Pond C1

Owner name: Lorson Ranch Metropolitan District

Location Address: 212 N. Wahsatch Avenue, Suite 301

Latitude and Longitude:

Latitude: 38°44'13.50"N, Longitude: 104°37'16.90"W

Assessor's Parcel #: 5500000279

Section: 13

Township: 15 South

Range: 65 West

Expected Completion date: August, 2020

Project acreage: 123.167 acres

Design Ponding Acres: 1.93acres

Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.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):

Pond C3 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs. The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

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. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

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.

Stormwater Detention and Infiltration Design Data Sheet

Worksheet Protected

User Input: Watershed Characteristics

Watershed Slope = 0.040 ft/ft

Watershed Length = 4800 ft

Watershed Area =	76.00	acres
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Watershed Imperviousness = 55.0% percent

Percentage Hydrologic Soil Group A = percent

Percentage Hydrologic Soil Group B = 100.0% percent

Percentage Hydrologic Soil Groups C/D = percent

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

Denver - Capitol Building

WQCV Treatment Method = Extended Detention ▼

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After completing and printing this worksheet to a pdf, go to:

<https://maperture.digitaldataservices.com/gvh/?viewer=cswdif>

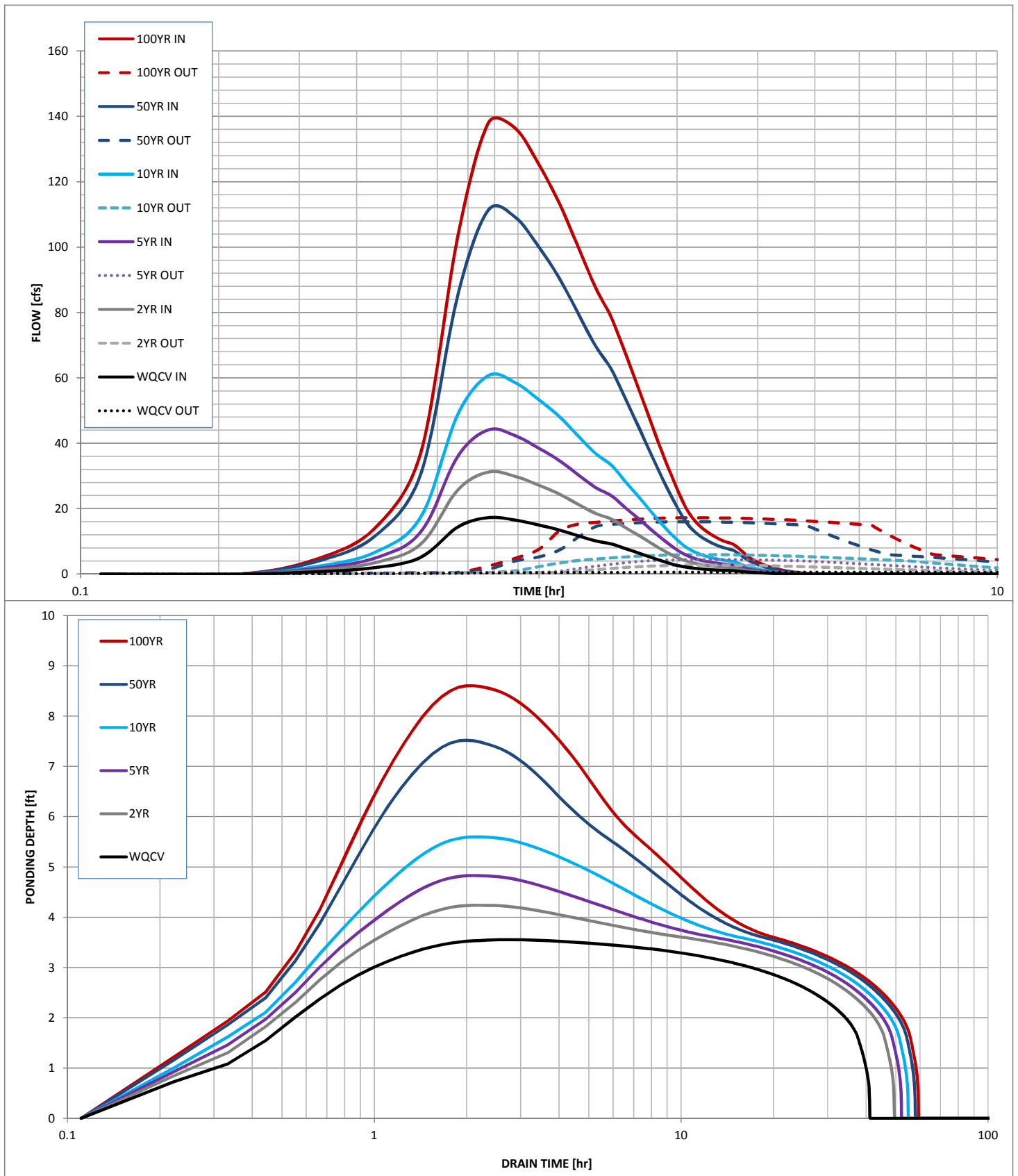
create a new stormwater facility, and

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	0.83	1.09	1.33	1.99	2.31		in
Calculated Runoff Volume =	1.396	2.541	3.609	5.009	9.332	11.640		acre-ft
OPTIONAL Override Runoff Volume =								acre-ft
Inflow Hydrograph Volume =	1.395	2.540	3.609	5.000	9.323	11.638		acre-ft
Time to Drain 97% of Inflow Volume =	38.2	44.9	46.2	47.2	45.5	44.9		hours
Time to Drain 99% of Inflow Volume =	39.9	47.4	49.5	51.5	52.5	52.9		hours
Maximum Ponding Depth =	3.55	4.24	4.83	5.60	7.52	8.60		ft
Maximum Poned Area =	1.25	1.38	1.45	1.53	1.72	1.84		acres
Maximum Volume Stored =	1.271	2.184	3.020	4.166	7.281	9.221		acre-ft

Stormwater Detention and Infiltration Design Data Sheet





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: The Hills at Lorson Ranch– Pond C2.1

Owner name: Lorson Ranch Metropolitan District

Location Address: 212 N. Wahsatch Avenue, Suite 301

Latitude and Longitude:

Latitude: 38°44'18.10"N, Longitude: 104°37'02.90"W

Assessor's Parcel #: 5500000371 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2020

Project acreage: 123.167 acres Design Ponding Acres: 1.42acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.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):

Pond C3 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs. The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

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. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

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.

Stormwater Detention and Infiltration Design Data Sheet

Worksheet Protected

User Input: Watershed Characteristics

Watershed Slope = 0.038 ft/ft

Watershed Length = 2500 ft

Watershed Area =	74.50	acres
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Watershed Imperviousness = 55.0% percent

Percentage Hydrologic Soil Group A = percent

Percentage Hydrologic Soil Group B = 100.0% percent

Percentage Hydrologic Soil Groups C/D = percent

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

Denver - Capitol Building

WQCV Treatment Method = Extended Detention ▼

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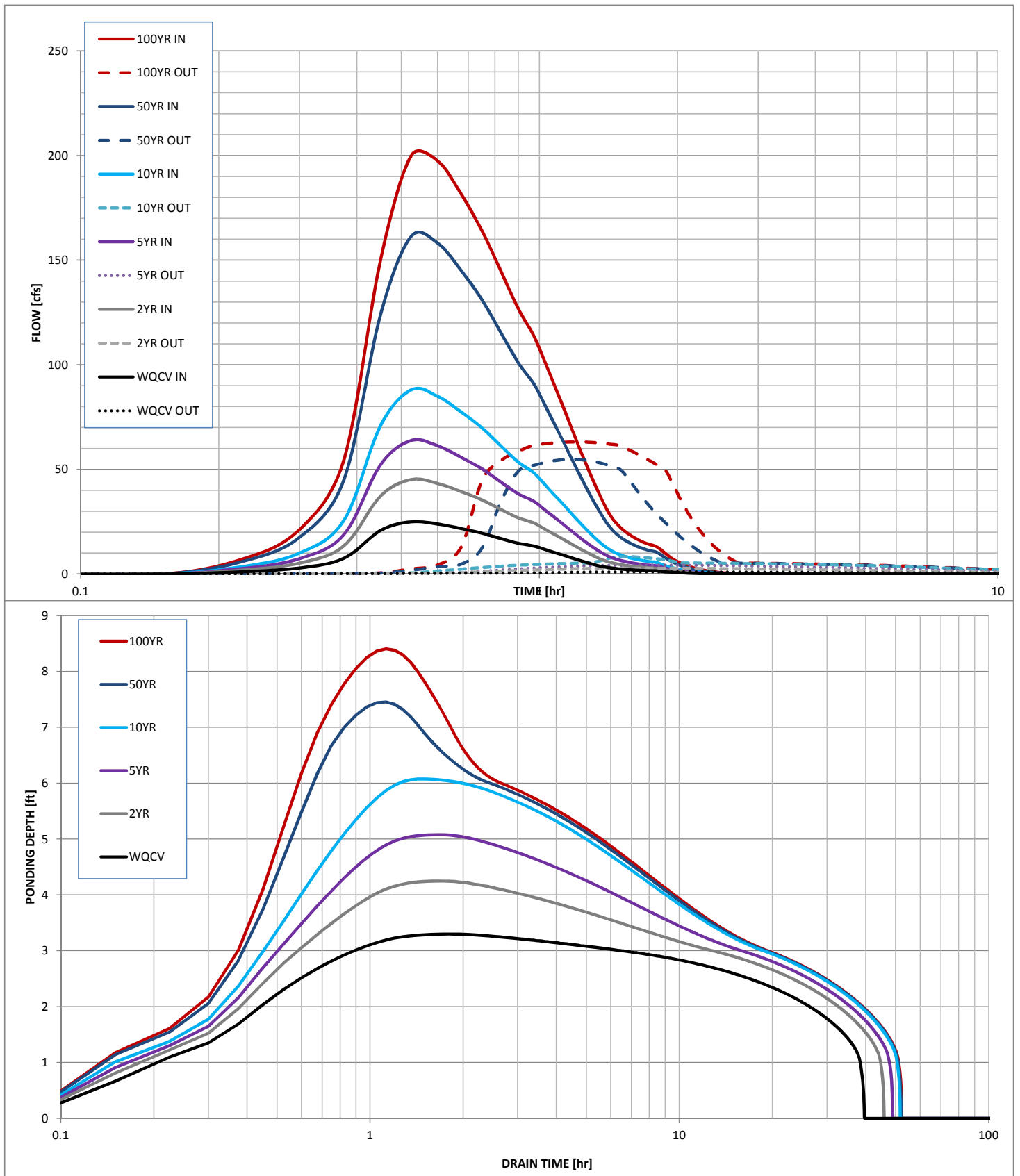
create a new stormwater facility, and

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	0.83	1.09	1.33	1.99	2.31	in
Calculated Runoff Volume =	1.368	2.491	3.538	4.910	9.147	11.410	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	1.368	2.490	3.537	4.909	9.144	11.409	acre-ft
Time to Drain 97% of Inflow Volume =	36.4	40.7	42.2	43.1	38.3	36.1	hours
Time to Drain 99% of Inflow Volume =	38.2	43.7	46.1	48.0	46.1	45.2	hours
Maximum Ponding Depth =	3.30	4.25	5.08	6.07	7.45	8.40	ft
Maximum Poned Area =	0.97	1.05	1.11	1.19	1.31	1.39	acres
Maximum Volume Stored =	1.248	2.205	3.099	4.250	5.978	7.266	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





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: The Hills at Lorson Ranch– Pond C2.2

Owner name: Lorson Ranch Metropolitan District

Location Address: 212 N. Wahsatch Avenue, Suite 301

Latitude and Longitude:

Latitude: 38°44'22.20"N, Longitude: 104°37'08.80"W

Assessor's Parcel #: 5500000405 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2020

Project acreage: 123.167 acres Design Ponding Acres: 1.24acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.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):

Pond C3 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs. The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

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. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

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.

Stormwater Detention and Infiltration Design Data Sheet

Worksheet Protected

User Input: Watershed Characteristics

Watershed Slope = 0.045 ft/ft

Watershed Length = 2500 ft

Watershed Area =	45.00	acres
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Watershed Imperviousness = 55.0% percent

Percentage Hydrologic Soil Group A = percent

Percentage Hydrologic Soil Group B = 95.0% percent

Percentage Hydrologic Soil Groups C/D = 5.0% percent

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

Denver - Capitol Building

WQCV Treatment Method = Extended Detention

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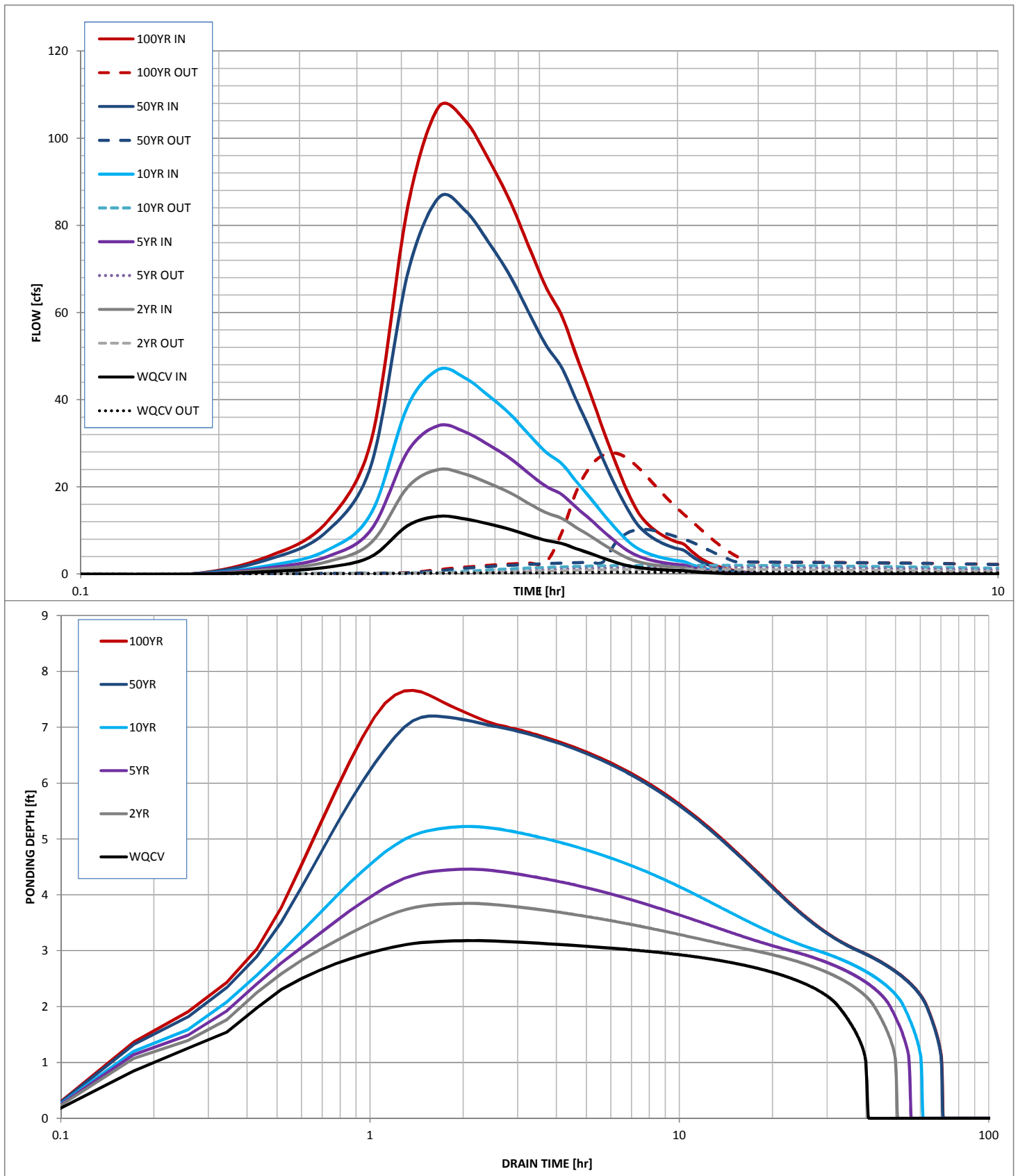
create a new stormwater facility, and

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	0.83	1.09	1.33	1.99	2.31	in
Calculated Runoff Volume =	0.827	1.507	2.148	2.973	5.537	6.906	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.826	1.506	2.148	2.973	5.532	6.902	acre-ft
Time to Drain 97% of Inflow Volume =	37.5	45.7	49.5	52.9	58.1	56.0	hours
Time to Drain 99% of Inflow Volume =	39.3	48.4	53.2	57.5	65.2	64.3	hours
Maximum Ponding Depth =	3.18	3.85	4.46	5.22	7.20	7.66	ft
Maximum Poned Area =	0.89	0.93	0.97	1.01	1.14	1.17	acres
Maximum Volume Stored =	0.757	1.363	1.946	2.706	4.823	5.354	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





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: The Hills at Lorson Ranch– Pond C2.3

Owner name: Lorson Ranch Metropolitan District

Location Address: 212 N. Wahsatch Avenue, Suite 301

Latitude and Longitude:

Latitude: 38°44'19.50"N, Longitude: 104°37'10.20"W

Assessor's Parcel #: 5500000278 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2020

Project acreage: 123.167 acres Design Ponding Acres: 0.93acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.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):

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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. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

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.

Stormwater Detention and Infiltration Design Data Sheet

Worksheet Protected

User Input: Watershed Characteristics

0.030

1700

16.00

55.0%

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40.0%

60.0%

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

Denver - Capitol Building

WQCV Treatment Method = Extended Detention

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After completing and printing this worksheet to a pdf, go to:

<https://maperture.digitaldataservices.com/gvh/?viewer=cswdif>

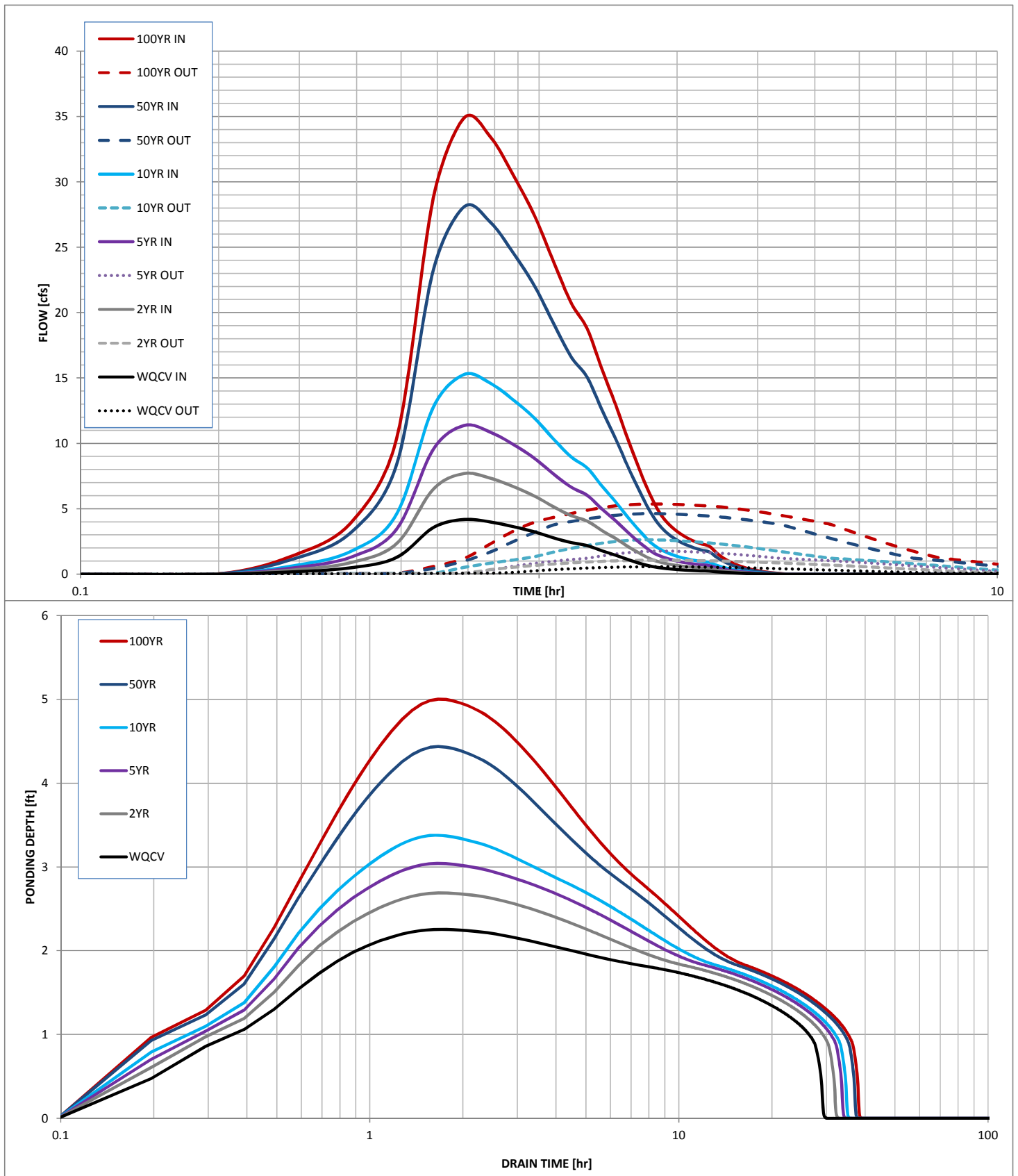
create a new stormwater facility, and

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	0.83	1.09	1.33	1.99	2.31	in
Calculated Runoff Volume =	0.294	0.544	0.807	1.088	2.016	2.510	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.294	0.543	0.807	1.087	2.015	2.510	acre-ft
Time to Drain 97% of Inflow Volume =	26.0	26.8	26.7	26.1	23.2	21.8	hours
Time to Drain 99% of Inflow Volume =	27.9	29.9	30.9	31.1	31.0	30.9	hours
Maximum Ponding Depth =	2.25	2.69	3.04	3.38	4.44	5.00	ft
Maximum Poned Area =	0.36	0.52	0.58	0.61	0.67	0.71	acres
Maximum Volume Stored =	0.234	0.423	0.622	0.824	1.504	1.894	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





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: The Hills at Lorson Ranch– Pond C3

Owner name: Lorson Ranch Metropolitan District

Location Address: 212 N. Wahsatch Avenue, Suite 301

Latitude and Longitude:

Latitude: 38°44'30.54"N, Longitude: 104°36'55.94"W

Assessor's Parcel #: 5500000274 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2020

Project acreage: 123.167 acres Design Ponding Acres: 1.46acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.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)

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O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Worksheet Protected

User Input: Watershed Characteristics

Watershed Slope = 0.040 ft/ft

Watershed Length = 1800 ft

Watershed Area = 26.00 acres

Watershed Imperviousness = 52.0% percent

Percentage Hydrologic Soil Group A = 0.0% percent

Percentage Hydrologic Soil Group B = 20.0% percent

Percentage Hydrologic Soil Groups C/D = 80.0% percent

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

Denver - Capitol Building

WQCV Treatment Method = Extended Detention ▼

[illegible]

After completing and printing this worksheet to a pdf, go to:

<https://maperture.digitaldataservices.com/gvh/?viewer=cswdif>

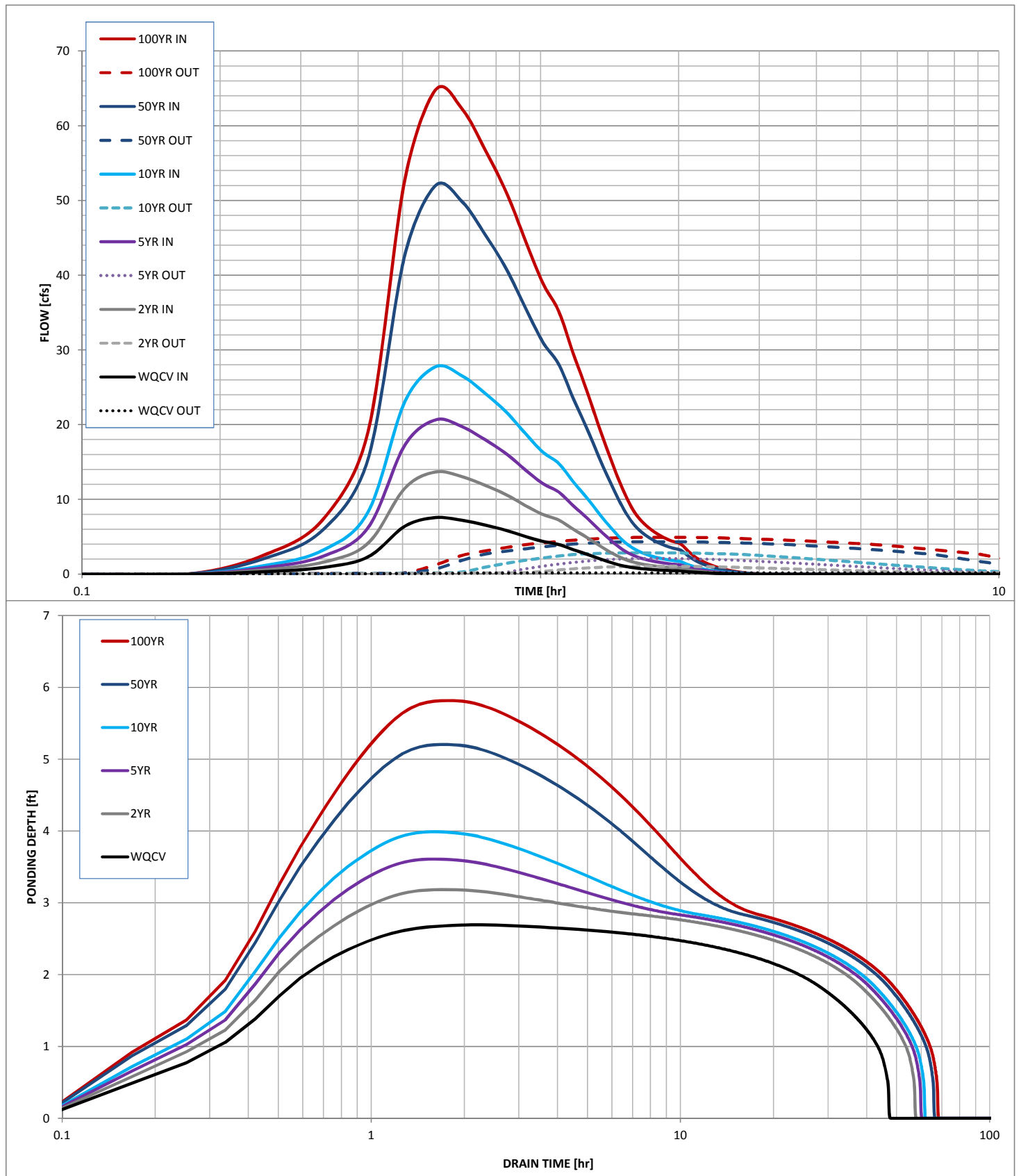
create a new stormwater facility, and

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	0.83	1.09	1.33	1.99	2.31	in
Calculated Runoff Volume =	0.459	0.834	1.267	1.708	3.228	4.037	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.458	0.834	1.266	1.707	3.227	4.037	acre-ft
Time to Drain 97% of Inflow Volume =	43.3	51.1	51.4	50.9	49.4	48.6	hours
Time to Drain 99% of Inflow Volume =	45.7	54.7	56.2	56.9	58.4	59.0	hours
Maximum Ponding Depth =	2.69	3.18	3.61	3.99	5.20	5.82	ft
Maximum Poned Area =	0.53	0.71	0.86	0.97	1.15	1.20	acres
Maximum Volume Stored =	0.430	0.731	1.067	1.416	2.717	3.435	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





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: The Hills at Lorson Ranch– Pond C4

Owner name: Lorson Ranch Metropolitan District

Location Address: 212 N. Wahsatch Avenue, Suite 301

Latitude and Longitude:

Latitude: 38°44'34.40"N, Longitude: 104°36'54.20"W

Assessor's Parcel #: 5500000275 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2020

Project acreage: 123.167 acres Design Ponding Acres: 1.59acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.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)

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O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Worksheet Protected

User Input: Watershed Characteristics

0.050

2300

81.00

55.0%

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40.0%

60.0%

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

Denver - Capitol Building

WQCV Treatment Method = Extended Detention ▼

[illegible]

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	0.83	1.09	1.33	1.99	2.31		in
Calculated Runoff Volume =	1.488	2.754	4.087	5.506	10.207	12.709		acre-ft
OPTIONAL Override Runoff Volume =								acre-ft
Inflow Hydrograph Volume =	1.487	2.754	4.086	5.502	10.198	12.700		acre-ft
Time to Drain 97% of Inflow Volume =	40.1	47.4	49.0	48.6	44.6	42.7		hours
Time to Drain 99% of Inflow Volume =	41.8	50.2	52.8	53.5	52.4	52.0		hours
Maximum Ponding Depth =	2.90	3.83	4.76	5.51	7.67	8.94		ft
Maximum Poned Area =	1.12	1.20	1.26	1.31	1.46	1.56		acres
Maximum Volume Stored =	1.404	2.481	3.626	4.592	7.587	9.506		acre-ft

Stormwater Detention and Infiltration Design Data Sheet

