



CORE
ENGINEERING GROUP

15004 1st Avenue S.
Burnsville, MN 55306
Telephone: (719) 570-1100
E-mail: rich@ceg1.com

Date: August 28, 2017

Project Number: 100.030

MEMORANDUM

To: El Paso County PCD **From:** Richard Schindler

Re: Carriage Meadows South at Lorson Ranch Filing No. 1

Transmitted herewith are the two Detention Pond SDI worksheets required for Carriage Meadows South at Lorson Ranch Filing No. 1. The two ponds are Pond G1/G2 and Pond G3.

Cc: Attachment – SDI Worksheets (two)

From: Richard L. Schindler, P.E.



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: Carriage Meadows South

Owner name: Lorson Ranch Metropolitan District

Location Address: 212 N. Wahsatch Avenue, Suite 301

Latitude and Longitude:

Latitude: 38°43'55.92"N, Longitude: 104°38'53.46"W

Assessor's Parcel #: 5500000343 Section: 22 Township: 15 South Range: 65 West

Expected Completion date: August, 2017

Project acreage: 106.64 acres Design Ponding Acres: 2.8 acres 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 G1/G2 is an Extended Detention Basin including water quality capture volume for Carriage Meadows South. The detention pond has been designed in accordance with full spectrum design.

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: N/A. full design standards achieved.

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

Workbook Protected

Worksheet Protected

Stormwater Facility Name: **Carriage Meadows South EDB Pond G1-G2**

Facility Location & Jurisdiction: **100' Northeast of the intersection of Wando Drive and Lorson Boulevard in El Paso County, CO**

User (Input) Watershed Characteristics

Watershed Slope = ft/ft
 Watershed Length-to-Width Ratio = L:W
 Watershed Area = acres
 Watershed Imperviousness = percent
 Percentage Hydrologic Soil Group A = percent
 Percentage Hydrologic Soil Group B = percent
 Percentage Hydrologic Soil Groups C/D = percent
 Location for 1-hr Rainfall Depths (use dropdown):

User Input: Detention Basin Characteristics

WQCV Design Drain Time = hours

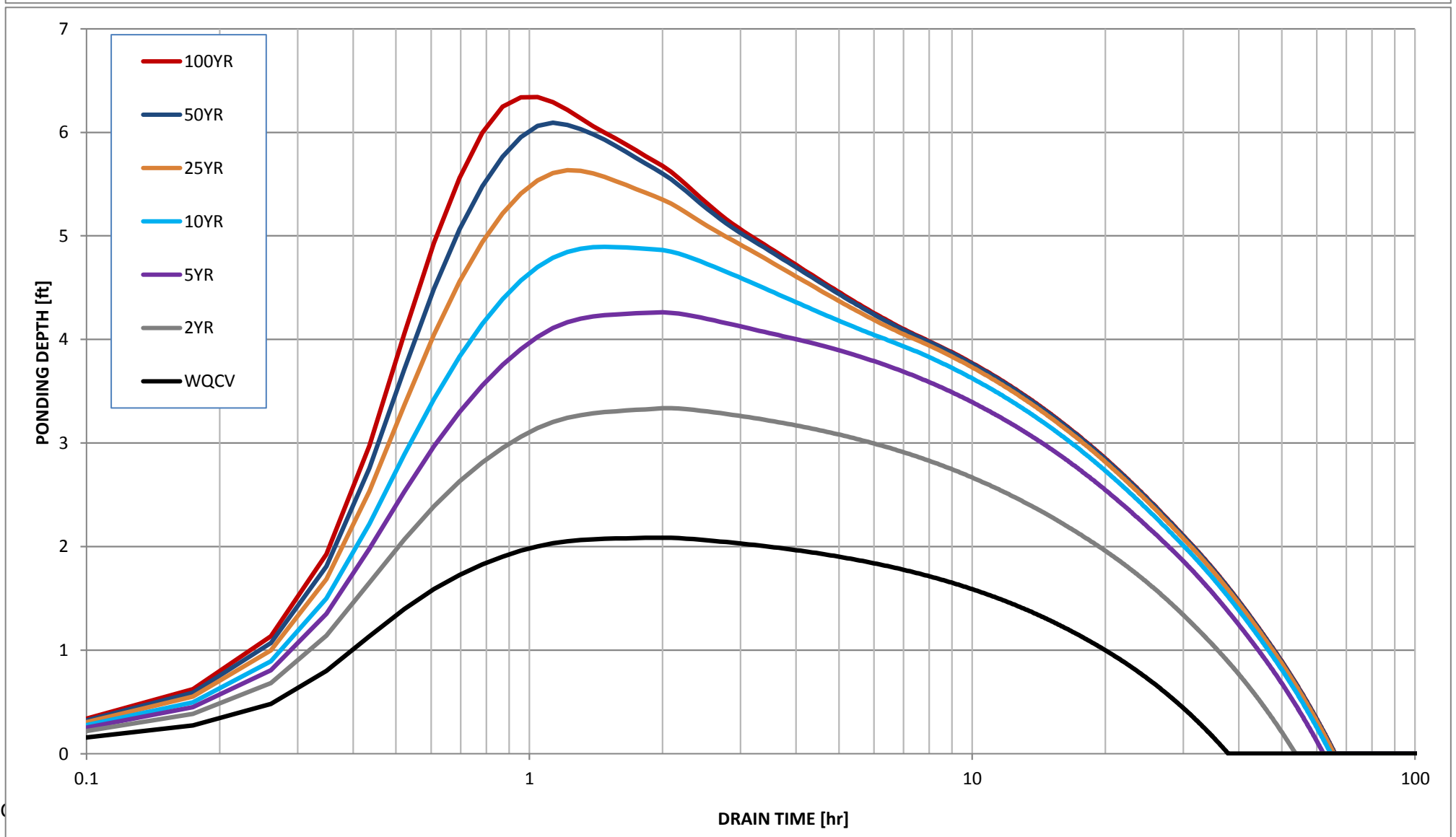
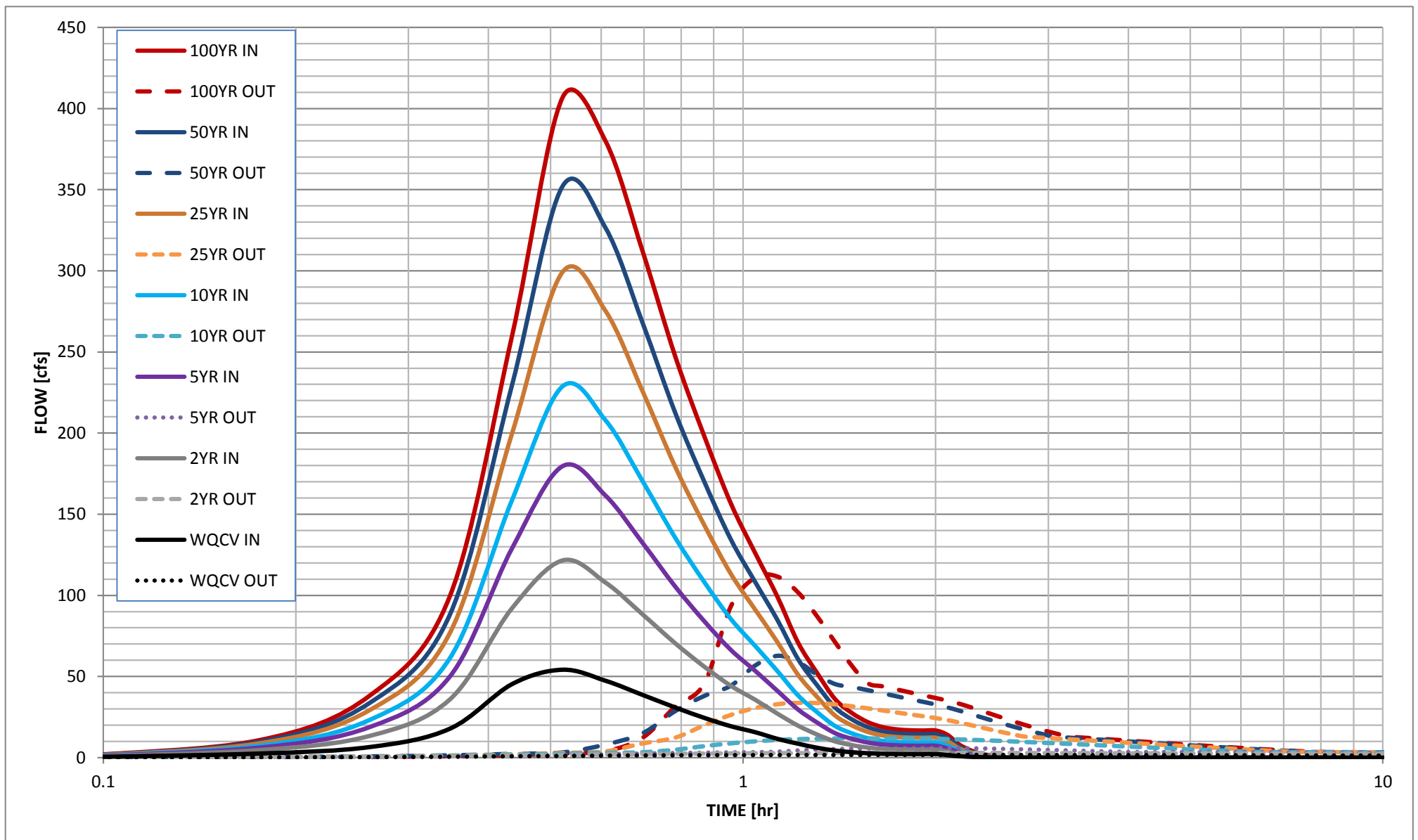
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]	Elevation
0.00	0	0.00	0.00	5682
1.00	47,723	1.00	0.74	5683
2.00	91,223	2.00	1.62	5684
3.00	108,717	3.00	2.58	5685
4.00	116,519	4.00	3.50	5686
5.00	126,736	5.00	12.90	5687
6.00	133,533	6.00	46.14	5688
7.00	142,697	7.00	240.85	5689
8.00	146,770	8.00	500.00	5690

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

	WQCV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
Design Storm Return Period =	0.53	0.95	1.34	1.64	2.02	2.32	2.61	in
One-Hour Rainfall Depth =	2.550	5.681	8.386	10.694	14.020	16.533	19.142	acre-ft
Calculated Runoff Volume =								acre-ft
OPTIONAL Override Runoff Volume =	2.550	5.675	8.385	10.693	14.018	16.529	19.141	acre-ft
Inflow Hydrograph Volume =	31	44	50	51	50	49	48	hours
Time to Drain 97% of Inflow Volume =	34	48	55	57	57	56	55	hours
Time to Drain 99% of Inflow Volume =	2.09	3.34	4.26	4.89	5.63	6.09	6.34	ft
Maximum Ponding Depth =	2.124	2.554	2.734	2.882	3.007	3.083	3.136	acres
Maximum Poned Area =	2.308	5.264	7.714	9.478	11.672	13.063	13.849	acre-ft
Maximum Volume Stored =								

Stormwater Detention and Infiltration Design Data Sheet





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Latitude and Longitude:

Latitude: 38°43'50.43"N, Longitude: 104°38'48.95"W

Assessor's Parcel #: 5500000263 Section: 22 Township: 15 South Range: 65 West

Expected Completion date: August, 2017

Project acreage: 106.64 acres Design Ponding Acres: 0.3 acres 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 G3 is an Extended Detention Basin including water quality capture volume for Carriage Meadows South. The detention pond has been designed in accordance with full spectrum design.

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: N/A. full design standards achieved.

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.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected

Worksheet Protected

Stormwater Facility Name: Carriage Meadows South EDB Pond G3

Facility Location & Jurisdiction: 700' Southeast of the intersection of Wando Drive and Lorson Boulevard in El Paso County, CO

User (Input) Watershed Characteristics

Watershed Slope =	0.016	ft/ft
Watershed Length-to-Width Ratio =	1.50	L:W
Watershed Area =	6.02	acres
Watershed Imperviousness =	65.0%	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
Location for 1-hr Rainfall Depths (use dropdown):		
UDFCD Default		▼

User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]	Elevation
0.00	0	0.00	0.00	5683
1.00	5,339	1.00	0.04	5684
2.00	7,055	2.00	0.29	5685
3.00	8,627	3.00	0.53	5686
4.00	10,260	4.00	15.57	5687
5.00	11,949	5.00	17.75	5688
6.00	14,318	6.00	19.68	5689

User Input: Detention Basin Characteristics

WQCV Design Drain Time = hours

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 create a new stormwater facility, and
 attach the pdf of this worksheet to that record.

Routed Hydrograph Results

	WQCV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Design Storm Return Period =	0.53	0.95	1.34	1.64	2.02	2.32	2.61
One-Hour Rainfall Depth =	0.126	0.290	0.460	0.601	0.812	0.976	1.146
Calculated Runoff Volume =							
OPTIONAL Override Runoff Volume =	0.126	0.289	0.459	0.600	0.812	0.975	1.146
Inflow Hydrograph Volume =	38	40	40	38	34	32	30
Time to Drain 97% of Inflow Volume =	41	46	47	46	44	43	42
Time to Drain 99% of Inflow Volume =	1.39	2.29	3.04	3.24	3.49	3.69	3.88
Maximum Ponding Depth =	0.138	0.172	0.200	0.207	0.216	0.224	0.231
Maximum Poned Area =	0.111	0.251	0.391	0.431	0.485	0.528	0.571
Maximum Volume Stored =							

Stormwater Detention and Infiltration Design Data Sheet

