DETENTION AND WATER QUALITY (WQ) STORMWATER CONTROL MEASURES (SCM) FACILITY CERTIFICATE REQUIREMENTS FOR ENGINEERS

A detention and water quality (WQ) stormwater control measure (SCM) facility certificate (CERT) is required per the City of Aurora Storm Drainage Design and Technical Criteria Manual for all detention ponds, underground detention, water quality (WQ) permanent stormwater control measures (SCM) structures, sand filters, bioretention, and other permanent EURV (excess urban runoff volume) and water quality (WQ) features/devices. For subdivisions with more than one pond or WQ facility/device a separate CERT letter shall be submitted for each pond or WQ facility/device. In the case of a proprietary WQ device in advance of the underground detention, these shall be combined into one CERT certificate. CERT reviews adhere to a 3-week first review, 2-week second review and 1-week subsequent review(s) periods until approved.

If you have any questions on the submittal process, please email AuroraWaterDrainage@auroragov.org. Documents are permitted to be sent via select FTP / file sharing programs.

The CERT letter requirements :

1. CERT letters shall be addressed to "Drainage Supervisor - Aurora Water" and emailed to AuroraWaterDrainage@auroragov.org . Include a statement certifying the pond will function as intended.
2. The CERT letter shall be an unlocked letter stamped and signed by a registered Colorado Professional Engineer.
    a. All permissions as a part of the submitted PDF shall be "allowed". The easiest method of doing this is to set the document's security settings as "No Security" in the Adobe/Blue Beam document settings, see the last page of this document for an example. The City will lock, and password protect the document as a part of approvals.
3. The letter shall include the Subdivision Plat/Civil Plan Name and the Engineering Drawing Number (EDN) of the approved Civil Plans (CPs) in the subject line. Reference any drainage letter or plan revisions that may have modified the pond, WQ, SCM facility/device (FACILITY) design outside of the originally approved CPs and Final Drainage Report (FDR). Please note, revisions to plans are required to be approved prior to CERT letter approval for changes to FACILITY (pond, WQ etc.) design.
4. If the pond has been assigned a dam ID as assigned by the State Engineers Office (SEO), provide that information in the submitted document text.
    a. If no determination was made by the SEO during design and now the pond meets or is significantly close to meeting the definitions of a jurisdictional dam, then a determination by the SEO will be required prior to CERT letter approval.
    b. If a determination was made by the SEO and the as-built pond significantly differs from design, then a re-determination by the SEO may be required.
    c. If the SEO requested as-builts for the subject pond, provided correspondence in the CERT letter that this has been provided to the SEO.
5. Include the Colorado Stormwater Detention and Infiltration Facilities Website Facility ID number.
6. Include in the certification letter all supporting information as outlined below:
    a. Any relevant approved variances from the FDR.
    b. Excerpts from the FDR for the approved design: MHFD approved design spreadsheets
    c. Include all pertinent approved FACILITY civil plan sheets (plan, outlet structure, spillway, forebay, device, infiltration basin etc.) (sized to 11x17) redlined with as-built information outlined in the following section using red or other easily discernable mark ups. Redlines are preferred to be on approved plan sheets with the EDN number in the upper left. If as-built information is the same as design, as-built data shall be redlined as "Confirmed", marked with a check, or similar.
    d. Provide scaled, topographic as-built survey (sized to 11x17) performed and stamped by a registered Colorado Professional Land Surveyor (PLS) that was used to confirm grading and other elements of the CERT. Differentiate between PLS surveyed information and information acquired by other individuals. Include the date survey and other measurements were taken. Additional survey may be required if photographs of the overall grading and CERT features do not agree with provided survey and measurements. Confirm the following (as applicable):
        i. Provide surveyed critical elevations and size(s) of each feature:

1. Bottom of micropool.
2. Orifice elevations.
3. Orifice diameters or dimensions.
4. Grate elevation(s), size(s) and slope(s).
5. Invert of outlet pipe.
6. Overflow weir elevation.
7. Top of embankment – include sufficient location in sufficient details to demonstrate that potential overflows will not bypass the spillway.
8. Restrictor plate height.
9. Trickle channel invert elevation at micropool, forebay, and other spot elevations supporting design slope.
10. Elevations to support redline pond bottoms slopes (minimum of 2%) to the trickle channel and pond swale side slopes.
11. All forebays: notch size, length, width, height, area, volume, and slopes of the forebay
12. Pond retaining wall elevations, top of wall and bottom of wall.
13. All other features that are unique to pond/WQ design.
14. Underdrain size and inverts.
15. Depth of filter material
16. Receiving Pervious Area (RPA) dimensions

ii. Confirm the following items:

1. Freeboard shall be redlined.
2. Trickle channel flush with pond grading, not perched.
3. Riprap installed and sized per plan. Uncover buried riprap in several locations for photos and proof of installation.
4. Weir concrete cut off wall installed per plan, edges of wall should extend up to the top of berm elevation and confirm with survey.
5. Pumps installed per plan, model confirmed, powered and working, float elevations should be confirmed.
6. Retaining walls constructed per plan.
7. Pond side slopes.
8. Dry ponds shall not be impounding water at time of certification (micropool excepted)
9. For proprietary facilities such as underground detention facilities or WQ devices, a manufacturer-provided certification letter shall be provided certifying that all underground features have been installed per plan. Confirm the Manufacturer and model number.
10. Cast in place underground detention features shall be surveyed **prior to backfill**
11. Underdrain installed per plan, including backfill material.
12. Railings and/or fences for areas where there is a drop 30" or greater.
13. Other features specific to FACILITY: WQ device, sand filter, grass swale etc.
14. All micropools within 10,000 ft of Denver International Airport must be covered.

e. Include the following calculations:

i. MHFD applicable spreadsheets (such as MHFD-Detention) updated with as-built conditions.
ii. Stage Storage calculations shall reference the required volumes from FDR. Stage-Storage curve data shall be created using as-built surveyed information.
iii. As-built data input into UD-Detention or MHFD-Detention (same version used in the design)
iv. Calculate as-built discharge rates and drain times.
v. Calculate as-built emergency weir overflow and water surface elevations.
vi. Calculated as-built elevations shall be based design volumes for the return periods in the FDR.
vii. For detention facilities near airports drain times will not be permitted to exceed the limits set forth by the Detention facility drain times for sites adjacent to air operations areas are limited by Federal Aviation Administration (FAA) recommendations contained in Advisory Circular

150/5200-33C (Federal Aviation Administration, 2020) and by additional guidance specific to Denver International Airport (DEN).

viii. Acceptable tolerance is generally 5% difference from design to as-built.

f. The engineer shall provide pictures of all features to support design. Include a title or description, the date taken, direction, annotate FACILITY features (and other items such as roadway names) for each picture. Photos shall provide a clear detail of the features they are capturing. Multiple items can be included in a single photo and multiple photos can be included on a single page (11x17 max size). Photos taken over 45 days prior to first submission of the CERT letter will not be accepted. Photos should not be taken with snow cover. The City reserves the right to request updated photos at any time and may be required to be updated if the total period between submittal exceeds three (3) months. Include the following photos at a minimum (as applicable to the FACILITY):
    i. Overall pond grading and berms (no ongoing construction, ponding, or debris within the pond).
    ii. Pond-maintenance path(s).
    iii. Trickle channel(s) (edges should be flush with adjacent pond grading and not perched).
    iv. Grading finalized (temporary erosion protection removed, final erosion protection installed).
    v. Restrictor plate (clear of debris) - include tape measure depicting orifice dimensions.
    vi. Orifice plate (clear of debris) - include tape measure depicting orifice dimensions.
    vii. Pump station (powered and working).
    viii. Micropool (clear of debris and sediment).
    ix. Grates (clear of debris and sediment).
    x. Forebay(s) (clear of debris and sediment) - include tape measure depicting notch dimensions.
    xi. All riprap locations (expose a portion if buried or provide both pre- and post-burial photos).
    xii. Emergency Spillway Weir and cutoff wall
        1. Provide photo upstream and downstream facing the weir/spillway showing full extents of weir/spillway cross section.
        2. Picture of the top of the weir (expose a portion of cutoff wall if buried).
        3. Include photos illustrating emergency overflow path downstream from spillway to design outfall (i.e. ROW, stream, etc.).
    xiii. Outlet pipe and outfall location.
    xiv. Retaining walls, head walls, wingwalls, and safety railings.
    xv. Outlet structure, inundation area, and unauthorized modifications signs.
    xvi. Other features that are unique to CERT design.
    xvii. Underground detention **prior to backfill.**
    xviii. Proprietary device **prior to backfill.**
    xix. Grass Swale, Grass Buffer
    xx. Infiltration medium
    xxi. Required base layer for permeable pavement, photos of the permeable pavement
    xxii. Receiving Pervious Area

g. Fill out and include the CERT As-built Table shown on the next page.

CERT Submittal Outline

1. CERT letter (1-2 pages).
2. FACILITY as built calculations including as-built updated MHFD spreadsheets and relevant excerpts from approve report or plans
3. FACILITY as-built table. (FACILITY tables for other FACILITIES will be posted later. In the interim please utilize the As-built Table For Ponds as applicable, and provide additional necessary documentation and calculations to demonstrate the as-built FACILITY meets the approved design.
4. FACILITY as-built survey (signed by PLS).
5. FACILITY as-built redlined of approved plans.
6. FACILITY photos.

AS-BUILT TABLE FOR PONDS

ITEM	DESCRIPTION	UNITS	DESIGN	AS-BUILT (PLS)	DIFF	DIFF UNITS
1	MICROPOOL INVERT ELEVATION	FT				FT
2	MICROPOOL DEPTH	FT				FT
3	MICROPOOL SURFACE AREA	SF				SF
4	WQCV	AC-FT				%
5	WQCV DEPTH	FT				FT
6	WQCV ELEV	FT				FT
7	WQ DRAIN TIME	HRS				HRS
8	SIDE SLOPES	Z:1				Z:1
9	ORIFICE ELEVATION 1	FT				FT
10	ORIFICE DIAMETER 1/ (OR RECTANGULAR AREA IN^2)	IN				IN
11	ORIFICE ELEVATION 2	FT				FT
12	ORIFICE DIAMETER 2(OR RECTANGULAR AREA IN2)	IN				IN
13	ORIFICE ELEVATION 3 *	FT				FT
14	ORIFICE DIAMETER 3 *(OR RECTANGULAR AREA IN^2)	IN				IN
15	10 YEAR VOLUME	AC-FT				%
16	10 YEAR DEPTH	FT				FT
17	10 YEAR WSEL	FT				FT
18	10 YEAR RELEASE RATE	CFS				CFS
19	EURV	AC-FT				%
20	EURV DEPTH	FT				FT
21	EURV ELEV	FT				FT
22	EURV DRAIN TIME	HRS				HRS
23	WQ / EURV ONLY PONDS – DRAIN TIME	HRS				HRS
24	OUTLET STUCTURE INVERT ELEV	FT				FT
25	100-YEAR RESTRICTOR PLATE HEIGHT (OR ORIFICE DIAMETER)	FT				FT
26	OUTLET PIPE DIAMETER (or culvert dimension BxH (ft))	IN				IN
27	OUTLET PIPE INVERT	FT				FT
28	OUTLET STRUCTURE GRATE ELEV	FT				FT
29	100-YEAR VOLUME ***	AC-FT				%
30	100-YEAR WSEL	FT				FT
31	100 - YEAR RELEASE RATE	CFS				CFS
32	100 – YEAR DRAIN TIME	HRS				HRS
33	TOP OF SPILLWAY ELEV	FT				FT
34	TOP OF BERM ELEV	FT				FT
35	WEIR CREST LENGTH	FT				FT
36	FREEBOARD TO SPILLWAY FROM 100 YEAR WSEL (DIFF BTWN 33 AND 26)	FT				FT
37	100-YEAR EMERGENCY SPILLWAY WSEL	FT				FT
38	FREEBOARD ABOVE EMERGENCY SPILLWAY WSEL TO TOP OF BERM	FT				FT
39	100-YEAR UNDETAINED DISCHARGE **	CFS				CFS
40	Lowest adjacent FFE (from the site which the pond serves or existing offsite building) NAVD88 DATUM	FT				FT

* ADD ADDITIONAL ORIFICE INFORMATION AS DICTATED BY THE DESIGN
** USED TO CALCULATE THE WSEL THROUGH THE EMERGENCY SPILLWAY
*** IF DESIGNED WITH ADDITIONAL VOLUME, SUCH AS 100 YEAR + 1.2 WQCV, DENOTE SO IN TABLE

Document Security Settings shall be set to “allowed”, see below example.