Master Drainage Report (MDR) Checklist

Instructions:
A Professional Engineer, licensed in the State of Colorado, must complete and sign this form as the Engineer of Record (EOR). By doing so, the EOR is certifying that the MDR submittal is complete and accurate per the items listed on this checklist, and in accordance with the latest version of Aurora's *Storm Drainage and Technical Criteria* (SDDTC).

This checklist shall be uploaded as a separate file to the Planning Department portal, along with the master drainage report and plan. This checklist shall be used as a guidance document only and shall not be considered comprehensive for submittal requirements. Master Plan will not be advanced for review until the MDR submittal is complete. Preliminary Drainage Report will be limited to three (3) reviews, additional review fees will apply to the fourth (4th) review.

Applicant & Project Information			
Planning Master Plan name or Project Name:			
Engineering Company:		**Phone:**	
EOR Name:		**E-mail:**	
Owner Company:		**Phone:**	
Owner Contact Name:		**E-mail:**	
Previous RSN (for MDR Amendment):		**Site area in acres:**	

I hereby certify that this Master Drainage Report is complete per the items listed on this checklist, and in accordance with the latest version of Aurora's Storm Drainage and Technical Criteria (SDDTC).

_____ _____ _____
Engineer of Record Printed Name Signature Date

_____
Engineer of Record Title

Master Drainage Report (MDR) Checklist

Reviewer Information (to be completed by Aurora Water staff)			
Name:		E-mail:	
Date:		Result:	
Submittal Type:			
Referrals Required:			
Notes:			

✗ below item number indicates deficiency. For AW staff use only.

Item	Description	Included	Not Applicable
01	A drainage kick-off meeting is required for all MDR submittals that contain regional infrastructure. The requirement to hold this meeting will be identified in the pre-application notes, or by direct communication with AW drainage staff. If a kick-off meeting is required, meeting minutes shall be prepared by the applicant, reviewed by all attendees, and included in the appendix of the MDR. Contact AuroraWaterDrainage@auroragov.org to request a meeting.	☐	☐
02	Drainage Plan must match the submitted Planning Department Master Plan.	☐	☐
03	The name of the MDR and plan set shall be the formal Planning Department Master Plan name.	☐	☐
04	Ensure that all items identified in the pre-application notes have been addressed.	☐	☐
	Report		
05	COA approval block must appear on the report cover.	☐	☐

Item	Description	Included	Not Applicable
06	Required report outline from Storm Drainage Design and Technical Criteria (SDDTC) Section 2.3.4 followed.	☐	☐
07	Advisory note that MDR approval is required prior to approval of Planning Dept Master Plan.	☐	☐
08	If variances are requested, see SDDTC Section 2.10 for guidance. If there are no variances requested, state “No variances requested.”	☐	☐
09	Identify any off-site basins and describe their impacts to the existing property.	☐	☐
10	Identify all outfalls from the property.	☐	☐
11	Watersheds with Special Requirements must be identified and their requirements considered in the design. These basins are: Aurora Reservoir, Cherry Creek Reservoir, High Line Canal, and Peterson Subdivision	☐	☐
12	Selected hydrologic calculation methods are consistent with SDDTC, MHFD criteria and sound engineering practice. See SDDTC Table 5-4 for guidance.	☐	☐
13	Hydrologic calculations are fully documented in report appendix.	☐	☐
14	Imperviousness values must be based on SDDTC Table 5-5.	☐	☐
15	Confirm routed/accumulated flows are computed at critical locations (ponds, roadway crossings, etc.) including design points.	☐	☐
16	Selected hydraulic calculation methods are consistent with SDDTC, MHFD criteria and sound engineering practice.	☐	☐
17	Hydraulic calculations are fully documented in report appendix.	☐	☐
18	Calculations for sizing of detention and other SCMs is fully documented in report appendix. MHFD design spreadsheets included.	☐	☐
19	Criteria and methodology for establishing drainageway corridor widths is appropriate and fully documented.	☐	☐
20	FEMA or FHAD floodplains are identified, and anticipated Letters of Map Change are listed.	☐	☐
21	Coordination with adjacent property owners has occurred and is documented.	☐	☐
22	Each basin or sub-basin is described in words.	☐	☐
23	Provide a table summarizing the percent impervious, runoff coefficient values for minor and major storms, and corresponding discharges for each sub-basin. Show routed flows where appropriate.	☐	☐
24	Discuss the structure concept for arterial and/or regional trail crossings of wide drainageways	☐	☐
25	Incorporate a table of detention facilities which notes the pond tributary area in acres, the pond function, the 100-year storage volume, total pond volume, estimated pond footprint, peak inflows,	☐	☐

Item	Description	Included	Not Applicable
	required release rates for design events, and required pond drain times for each detention facility.		
26	Describe how perimeter roadway drainage will be addressed. Perimeter roadway must be considered in hydrologic calculations, conveyance, detention and water quality.	☐	☐
27	Discuss the overall approach to water quality. Indicate whether the Stormwater Control Measures (SCMs) provided are regional water quality SCMs identified in an OSP or intended to be subregional for future site plan areas. Identify if any SCMs are intended as multi-use facilities. For any regional SCMs, identify the location of the facility.	☐	☐
28	Discuss if any of the drainage infrastructure is intended to be maintained by the Aurora Water and why.	☐	☐
29	References: List all criteria, existing drainage reports, MDR(s), City Master Plan(s), floodplain studies, MHFD MDPs, etc. used in the report. Provide citation information including author and date of each reference. Note the EDN or RSN for CoA-approved documents.	☐	☐
	Appendices		
30	NRCS Soils Report with the site boundaries delineated and the hydrologic soil groups identified.	☐	☐
31	One-hour point precipitation depths for all design events per NOAA Atlas 14.	☐	☐
32	FEMA FIRM or FIRMette with the site boundaries delineated.	☐	☐
33	Airport Detention Pond Buffer Zone with the site boundaries delineated and accounted for in design.	☐	☐
34	Excerpts from previously approved reports, plans, etc. Annotate/highlight relevant information. Note the EDN or RSN where applicable.	☐	☐
35	Printouts or listings for all calculations, including CUHP and SWMM, must be provided in PDF format within the report appendix.	☐	☐
36	Electronic copies of models used in above analysis. Provide all input and output files and ensure all submitted models are executable. If required files exceed the limitations of upload portal, send by e-mail or download link to AuroraWaterDrainage@auroragov.org.	☐	☐
	Drainage Plan		
37	Drainage Plan must be formatted as a full-size drawing (24” x 36” or 22” x 34”) and uploaded as a separate file.	☐	☐
38	COA approval block must appear only on the first sheet of the drainage plan.	☐	☐
39	No copyright notes may appear on the plan.	☐	☐
40	Include note from SDDTC Section 2.6 (General Conformance), as follows: City of Aurora plan review is only for general conformance with City of Aurora Design Criteria and the City Code. The City is not responsible for the accuracy and adequacy of the design, of dimensions and elevations which must be confirmed and correlated at the job site. The City of Aurora, through the approval of this	☐	☐

Item	Description	Included	Not Applicable
	document, assumes no responsibility for the completeness and/or accuracy of this document.		
41	Provide a City of Aurora vertical benchmark on all sheets containing vertical information. Go to the City's website to find benchmarks, and be sure to include the COA ID, description, and elevation in feet NAVD88.	☐	☐
42	If the drainage concept relies upon an existing pond, include the following note from SDDTC Section 2.6 (Pond Recertification): Applicant understands recertification may be required. If a pond certificate, an executed I&M plan, or drainage easements do not exist, the applicant will be required to provide these prior to civil plan approval.	☐	☐
43	Legend showing all symbols, linetypes, and fills/hatches used on the plan. Exclude any symbols, linetypes, and/or fills/hatches not used on the plan.	☐	☐
44	Vicinity map.	☐	☐
45	Indicate the design recurrence interval for storm pipe infrastructure.	☐	☐
46	State whether storm infrastructure is public or private, and who will be responsible for maintenance. These requirements can be addressed with the following note from SDDTC Section 2.6: All storm infrastructure is [*private/public*] and designed for the [*design recurrence interval*] storm event	☐	☐
47	Plan sheets with scales as small as 1" = 200'; scales of 1" = 100' or larger are preferred with overview sheet.. Off-site drainage basins may use a scale as small as 1" = 500'.	☐	☐
48	Existing topography at a 2-foot contour interval minimum. Proposed grading at 2-foot contour interval minimum. Contours must provide sufficient coverage to completely encompass all existing and proposed drainage basins (on-site and off-site). Contours must be extended a minimum of 50-feet beyond the property lines or further as necessary to clearly identify off-site drainage patterns and show the tie-in between the proposed grading and existing topography.	☐	☐
49	CoA jurisdictional boundaries as applicable.	☐	☐
50	SWMM model schematic diagram depicting all drainage basins, conveyance elements, storage elements, junctions etc., if applicable. May be included in report, as long as the schematic is clear.	☐	☐
	Hydrologic Information		
51	Flow direction arrows with slope in percent for proposed on-site grading and off-site areas.	☐	☐
52	Drainage basin boundaries and design points.	☐	☐
53	Table with the basin identifier, basin area (acres), percent imperviousness, and major and minor design flows for all basins and design points; include runoff coefficients for the design storms as well if Rational Method is used. The table must include the direct	☐	☐

Item	Description	Included	Not Applicable
	runoff for each basin and the accumulated (routed) flows for each design point, with tributary basins to a design point identified. Note that design points should not have an imperviousness or runoff coefficient value associated with them in the table row (separate tables for the basin information and design point flows may be provided if so desired).		
	Floodplains, Stream Management Corridors and Fluvial Hazard Zones		
54	Floodplain information, including the 1% annual chance floodplain and floodway limits and BFEs, if available, from FIRMs, FISs, FHADs, or other Best Available Information. Source(s) shall be provided on the plan (FEMA panel number and effective or document, date and author of BAI)	☐	☐
55	If any work is planned within the floodplain, include note from SDDTC Section 2.6 (Floodplain Development Permit): Applicant understands that work in 100-year Floodplain requires a Floodplain Development Permit which must be obtained prior to grading or construction within the floodplain.	☐	☐
56	Stream Management Corridors. Label corridor widths and identify conceptual locations for grade control and bank revetment structures.	☐	☐
57	Fluvial Hazard Zone mapping, where applicable.	☐	☐
58	Identification of reaches where bank stabilization is required.	☐	☐
	Existing and Proposed Infrastructure		
59	Existing and proposed detention pond locations. Include the pond tributary area, pond function, 100-year storage volume, total pond volume, estimated pond footprint, and required release rates for design events. Clearly identify the pond emergency overflow locations and flow directions.	☐	☐
60	Existing and proposed culvert crossings of arterial and collector roadways. Label the culvert size, emergency overflow location, and flow direction.	☐	☐
61	Existing and proposed outfall location(s).	☐	☐
62	Labeling of all adjacent properties, subdivisions, developments, existing and proposed off-site infrastructure, connected MDRs, PDRs and/or Civil Plans, etc. Note the EDN or RSN where applicable.	☐	☐
63	Labeling and dimensioning of existing and proposed right-of-way (ROW) where available. Label adjacent arterial or collector roadways (existing or proposed).	☐	☐

Key Storm Drainage Criteria to Verify (Based on commonly seen errors)			
Hydrologic Analysis			
64 ☐	Basin boundaries correspond to existing topography or future site layout and grading has been incorporated.	☐	☐
CUHP (Where applicable)			
65 ☐	Depression loss values correspond to MHFD and COA criteria.	☐	☐
66 ☐	Infiltration method parameters correspond to SDDTC 5.3.3.	☐	☐
67 ☐	Imperviousness values based on SDDTC Table 5-5.	☐	☐
68 ☐	Directly Connected Impervious Area (DCIA) Level is accurate. *Use 0 unless distributed LID measures utilized throughout watershed.*	☐	☐
69 ☐	100% imperviousness used for WQCV portion of detention ponds.	☐	☐
SWMM (Where applicable)			
70 ☐	Pond storage curves in SWMM match curves on plans and calculations.	☐	☐
71 ☐	Pond discharge curves in SWMM match curves on plans and calculations.	☐	☐
72 ☐	CUHP output hydrographs are applied to the correct SWMM nodes.	☐	☐
73 ☐	Link connectivity in SWMM model is correct.	☐	☐
74 ☐	Continuity error is insignificant.	☐	☐
75 ☐	Kinematic wave method is used.	☐	☐
Hydraulic Analysis			
New or modified ponds			
76 ☐	Applicable detention, EURV and water quality requirements are met.	☐	☐
77 ☐	Volumes computed by appropriate methods. See SDDTC Table 10-2.	☐	☐
78 ☐	Preliminary pond footprint shown.	☐	☐
79 ☐	Proposed pond should not classify as a jurisdictional dam.	☐	☐
80 ☐	Proposed ponds located near airports identify and apply requirements in SDDTC 10.14.	☐	☐
Use of existing ponds			
81 ☐	If an existing pond is being expanded or changed due to tributary area change, percent impervious increase or some other aspect of the pond is being changed, that pond must be brought up to current design standards.	☐	☐
Storm Sewer System			
82 ☐	When connecting to an existing storm sewer pipe, call out the offsite flow rate projected for the receiving storm sewer system at the point	☐	☐

	of connection and reference the name and date of the study. If no previous study exists, analysis showing adequate capacity must be performed by Applicant and provided with MDR.		
Culverts			
83 ☐	All culverts must be designed to pass the 100-year peak flow, subject to the allowable headwater depth criteria in SDDTC 9.4.4.	☐	☐
84 ☐	No road overtopping is allowed up to and including the 100-year event.	☐	☐
85 ☐	When box culverts reach or exceed a width of 8 feet, the minimum height must be 6 feet.	☐	☐
Open Channels			
86 ☐	Criteria relative to the classification of stream (major, minor, swale/ditch) are met. See SDDTC 7.2.	☐	☐
87 ☐	Discharges from hydrologic study are applied to the proper cross-sections in hydraulic analysis.	☐	☐
Floodplains			
88 ☐	Correct and most up-to-date floodplain information is shown on the plans.	☐	☐
89 ☐	Source documents, such as a FIRMette, are including in the report appendix.	☐	☐
90 ☐	Applicable floodplain requirements, particularly requirements for minimum LFE and/or LPE are identified in report and plan.	☐	☐
91 ☐	Setback requirements are identified in report and plan. See SDDTC 4.5.2.	☐	☐
Overall			
92 ☐	Descriptions, elevations, dimensions, specifications, etc. must be consistent in all parts of the submittal, including report narrative, calculations, and plan sheets.	☐	☐