CITY OF LOVELAND

STORM DRAINAGE CRITERIA

(ADDENDUM TO THE

URBAN STORM DRAINAGE CRITERIA MANUALS

VOLUMES 1, 2 AND 3)

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Storage

2.0 APPLICATION OF DIFFERENT TYPES OF STORAGE

Add 6. Above ground parking lot detention ponds may be utilized when land area for a grassed lined detention pond is not available. To prevent damage to and floatation of automobiles, parking lot detention ponds shall not exceed 12 inches in depth at any point. Parking lot detention ponds shall be signed as such to inform the general public about the potential for flooding. A parking lot detention pond shall not encroach into a public street.

3.1.2 Use of Regional (i.e., Hydrograph Routing) Detention Sizing Procedure

Change …the District recommends…
To …the City of Loveland recommends…

3.1.3 Water Quality Capture Volume in Sizing Detention Storage

Add Within the City of Loveland, the water quality capture volume shall be considered a portion of the total 100-year detention pond volume obtained using the simplified full spectrum detention pond design method.

3.2.1 Maximum Allowable Unit Release Rates for On-Site Facilities

Change …in a District-approved…
To …in a City of Loveland-approved…

3.2.2 Empirical Equations for the Sizing of On-Site Detention Storage Volumes

Change …for areas within the District.
To …for areas within the City of Loveland.

Change If the District has…
To If the City of Loveland has…

3.2.4 Simplified Full-Spectrum Detention Sizing (Excess Urban Runoff Flow Control)

Change …the District does not…
To …the City of Loveland does not…

3.2.5 Excess Urban Runoff Flow Control at Regional Facilities

Change …in a District accepted…
To …in a City of Loveland accepted…

3.2.6 Multi-Level Control

Change	The District recommends…
To	The City of Loveland recommends…

Delete	the 5 - or

3.3 Design Storms for Sizing Storage Volumes

Add	The excess urban runoff and 100-year storm shall be the design parameters for all detention pond designs within the City of Loveland.

3.3.2 Drainage and Flood Control

Change	Whenever a District-approved…
To	Whenever a City of Loveland-approved…

3.3.3 Spillway Sizing

Add	Each detention pond shall contain an emergency spillway capable of conveying the peak 100-year storm discharge draining into the detention pond. The invert of the emergency spillway shall be set equal to or above the 100-year water surface elevation. The depth of flow out the emergency spillway shall be $\leq$ 6 inches.

3.3.4 Retention Facilities

Change	…solution, the District recommends…
To	…solution, the City of Loveland recommends…

3.4 Reservoir Routing of Storm Hydrographs for Sizing of Storage Volumes

Change	2. Determine Hydrology: The hydrograph may be available in published district outfall system planning or a major drainageway master plan report.
To	2. Determine Hydrology: The hydrograph may be available in the published City of Loveland Master Drainage Plan or Updates.
Change	…out in a District-approved…
To	…out in a City of Loveland-approved…

3.4.1 Initial Sizing

Change 3…from a District Master Plan,…
To 3…from a City of Loveland Master Plan,…

3.4.2 Initial Shaping

Change …the District encourages…
To …the City of Loveland encourages…

4.0 FINAL DESIGN CONSIDERATIONS

Change The District urges…
To The City of Loveland urges…

4.3 Geometry of Storage Facilities

Change …within the District…
To …within the City of Loveland…

Delete or fortification of the embankment to prevent catastrophic failure when overtopped.

4.4 Embankments and Cut Slopes

Change 2. Freeboard – The elevation of the top of the embankment shall be a minimum of 1 foot above the water surface elevation when the emergency spillway is conveying the maximum design or emergency flow.

To 2. Freeboard – The elevation of the top of the embankment shall be a minimum of 1 foot above the 100-year water surface elevation in the detention pond.

Add 5. Emergency Spillway Downstream Protection – From the emergency spillway downhill to the embankment toe of slope, buried riprap shall be placed and covered with 6 inches of topsoil in order to protect the emergency spillway slot from catastrophic erosion failure. The riprap shall be sized at the time of final engineering design.

6. Concrete Cutoff Wall – A concrete cutoff wall, 8 inches thick, 3 foot deep, extending 5 feet into the embankment beyond the emergency spillway opening, is encouraged on all private detention ponds and required on all public regional detention ponds. A concrete cutoff wall will permanently define the

emergency spillway opening. The emergency spillway elevation shall be tied back into the top of embankment using a maximum slope of 4:1.

4.7 Outlet Works

Add The outlet pipe of a regional detention pond shall contain a minimum of two (2) concrete cutoff walls embedded a minimum of 18" into undisturbed earthen soil. The cutoff walls shall be 8 inches thick. The outlet pipe bedding material shall consist of native earthen soil and not granular bedding material to at least the first downstream manhole or daylight point.

4.11 Access

Add Drivable access applies only to Regional Detention facilities within the City of Loveland. Each regional detention pond will be considered on a case-by-case basis at the time of final design.

5.0 CRITERIA FOR DISTRICT MAINTENANCE ELIGIBILITY

Add Regional Master Planned detention ponds, designed and constructed by or on behalf of the City of Loveland, shall be owned and maintained by the City of Loveland Stormwater Utility. All other detention ponds shall be considered privately owned and privately maintained.