

Larimer County Stormwater Standards - Response to Comments

Comment Number	Section	Context	Comment	Response
1	1.2	Referring to use of MHFD Manual	Does this easily communicate with the fort collins standards since those are different?	Yes. Although there certainly are differences among all stormwater manuals/standards, the overall intent is to be as consistent as possible with others.
2	1.6	Referring to "...recorded issues or accepted by the County..."	Clarify	Text will be modified to eliminate "recorded issues or" to be more clear.
3	2.2	Referring to the County "may" require the letter to be signed	Likely to receive push back when required if this language appears.	Comment noted. The County expects to accept most drainage letters without the need for PE stamp/signature, however it reserves the right to do so when circumstances warrant.
4	2.2	<i>Referring to "All the following criteria must be met to substitute a Drainage Letter for a full drainage report".</i>	would prefer clarification of how these are to be proven (ie. impervious analysis)	Each situation will be different and it is difficult to be overly prescriptive. A drainage letter will generally be allowed where meeting the criteria can reasonably be demonstrated/proven without significant engineering analysis.
5	2.2	Referring to "The following sections describe some of the submittal requirements....."	this was stated before. Would leave it as one time to cover all instances of changes	Agree. This repetitive text will be removed.
6	2.2.2	Referring to "Identify any on-site or nearby drainage features, such as culverts, drainages, lakes or reservoirs,....."	Clarify what is "nearby"	Text will be revised to state "Identify drainage features that are on-site and/or adjacent to the site..."

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7	2.2.3	Referring to map of the site that include “project boundaries, contours”.	Scale of contours? basins required?	The scale of contours will depend on project and location. Typically at least 2 feet for an urban area and at least 5 feet for rural areas. The intent is to demonstrate flow/drainage paths. Basin delineations would generally not be required.
8	2.3	Referring to “the overall submittal requirements may change over time and will be based on the most recent PDR Checklist available in the Appendices of the standards”	make sure this is limited to pass through and discharge from (ie. detention volumes). some jurisdictions are requiring onsite emergency overflow and other items that will not be determined until final grading design/final CDs are done.	This text will be modified to clarify expectations. “The overall intent of the PDR and the County’s review of the PDR is to demonstrate the proposed project is technically feasible (from a stormwater management perspective) and to identify potential drainage issues that should be addressed prior to moving to final design.”
9	2.3.1	Referring to repetitive text on submittal requirements and checklists.	Again, clarify changes are possible only once at the beginning	Agree. This repetitive text will be removed.

Comment Number	Section	Context	Comment	Response
10	2.3.1	Referring to “A professional engineer’s certification statement is required.....”	Would generally say a stamped report should not be required until final or a clarifying statement included that it is not for construction or record.	<p>The County will require the final (approved) version of the PDR to be PE signed/stamped. This is standard practice with most counties/municipalities and assures the report and plans have been reviewed by a registered PE.</p> <p>Agree with the comment that a statement should also be included that plans are not for construction. The following text will be added to this section “The PDR and Plans shall include the following statement: These plans are not to be used for construction or final record”.</p>
11	2.3.2	Referring to “proposed characteristics that influence drainage on the site.”	For preliminary, make sure this isn't overly arduous. Details like overflows are not know until final design is complete. Make sure that the point is to show that it CAN be designed to work, not to have all the details worked out.	Comment noted. See response to similar comment above.
12	2.3.2.2.	Referring to “the major and sub-basins”	Clarify that this is not "on-site" major/minor basins and intended to mean overall basins	Agree. This text will be removed as it is addressed in Section 2.3.2.3.
13	2.3.2.3	Referring to “Any basin parameters used in calculations should be described...”	Clarify that this is aggregate not detail and intended for compliance with detention and discharge only for preliminary	Agree. This statement will be removed and replaced with “Include discussion of any discharge or detention requirements identified in previous basin studies and relevant to the project.”

<b>Comment Number</b>	<b>Section</b>	<b>Context</b>	<b>Comment</b>	<b>Response</b>
14	2.3.2.3	Referring to sub-basins and “historic on- and off-site drainage patterns...”	Per above, this could get out of control with how much a reviewer could required at preliminary. Generally in prelim, only sub-basins required where there is no other option	Agree this is confusing language. As this relates to the narrative text in the report, the subject sentence will be removed and replaced with “The report narrative should also include a description of the sub-basin(s) delineated for the project site. The narrative should include the sub-basin name, proposed imperviousness, major and minor peak discharge rates, and discharge location or design point.”
15	2.3.2.4	Referring to “Any site constraints impacting drainage...”	Add the word “overall” after “impacting”	Comment noted, but not incorporated. It is unclear how adding “overall” will improve the Standards.
16	2.3.2.4 (page 15)	Referring to “Include preliminary capacity analysis of all existing and proposed drainage...”	only proposed if offsite or downstream to prove that the design CAN work.	Comment noted, but not incorporated. Preliminary calculations for drainage infrastructure are important for appropriate review at the PDR stage. If calculations show that Standards cannot be met, modifications to the proposed design may be necessary.
17	2.3.2.5	Referring to “Provide a preliminary discussion of drainage problems on-site and possible solutions. Include design flows and storage volumes...”	hopefully only as the affect downstream in prelim.	Comment noted, but not incorporated. Design flows at on-site design points will be required. (See also response to comment #16 above).

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18	2.3.2.5	Referring to “In cases where the point of outfall or peak flow from the property is other than historic, <b>binding agreements</b> from affected property owners.....”	Should only be letter of intent at preliminary	Agree. Text will be modified to add “...or letter of intent”
19	2.3.2.8	Referring to “All existing and proposed runoff calculations, as well as all assumptions and parameters used.”	Ensure these are at a high level/overall site wide since the detail will not yet be known. We don't want preliminary drainage standards to dictate a final level grading design at preliminary.	Comment noted, but not incorporated. Responses to previous comments address this.
20	2.3.2.8	Referring to “Preliminary hydrologic and hydraulic calculations for water quality and flood control facilities should be included.”	this should be a must for proof the project can work.	Comment noted.
21	2.3.3.2	Referring to the whole paragraph “Detailed Drainage Plan	Very little of this should be required at preliminary since it is not for the purpose of verifying the project CAN work.	Comment noted, but not incorporated. See responses to previous comments that address this.
22	2.4	Referring to “When approved, the report will be signed by the County Engineer and shall constitute conceptual approval of the drainage plan...”	This should be final approval of the drainage plan. If concern is that the county engineer is not responsible for the correctness require a statement of indemnification.	Agree with the comment. The word “conceptual” will replaced with “final”.

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23	2.4 (second paragraph)	Referring to “...overall submittal requirements may change over time and will be based on the most recent FDR Checklist available in the Appendices of the Standards.”	put in one time at beginning instead of every section	Agree. This repetitive text will be removed.
24	2.4.1.1	Referring to the whole paragraph.	<p>This is where it should be mentioned to what level sub-basin calculations are required. Include overflow calculations.</p> <p>It would be good to show that typical calculations are acceptable including documenting where they are applicable instead of requiring redundant/superfluous calcs. (ie. Street Cap)</p>	<p>Comment noted, but not incorporated. The “level” of sub-basin calculations should be sufficient to demonstrate the Standards are met or exceeded, as noted in the Standards language.</p> <p>This section refers to the narrative of the FDR. It is a “description” of “results” and is not intended to require reductant/superfluous information (methods, calculation, etc.) that is documented elsewhere in the FDR.</p>
25	2.4.4	<i>Referring to “As-Builts” in the paragraph header?</i>	seems like this should be a separate category.	Agree. “As-Built” requirements will be moved to a separate section immediately below (2.5).
26	2.4.4	Referring to “Prior to submittal of the final construction drawings...”	Why are construction drawings here instead of just with the final utility plan standards? Should basically be a final report and maps required, correct?	Construction plans are submitted with final drainage plan/report.

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27	2.4.4, page 18	Referring to “All new developments within the County are required to submit for review and approval an overall site certification of the constructed drainage facilities.”	If any of this is already required by utility plan standards, it should be left only there.	Comment noted and addressed by moving As-Built submittal requirements to a new section.
28	2.4.4 (last paragraph)	Referring to “Individual lot or building”	separate section clarifying Single-family grade certification requirements and by builder's engineer, not site engineer	Comment noted and addressed by separating As-Built certification requirements and lot grading certification requirements into separate sections.
29	2.6	Addition to certification area	could put in here the indemnification of the county engineer's if you'd like.	Comment noted, but not necessary.
30	3.2	Addition to end of point 1.	and clarified in the site development where master plans are not available.	Agree with the comment, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.
31	3.2	Addition to last sentence in point 5, after “capacity required”	and infrastructure cost	Agree with the comment, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.
32	3.2 (point 8)	Referring to “coordinated efforts should be made to minimize increases in and reduce where possible stormwater runoff, flow rates...”	Reducing flow rates is not necessarily a good stream ecology goal, it should be to mimic the natural flow regime including allowing natural flushing storms where they will not cause property damage.	Comment noted, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.

<b>Comment Number</b>	<b>Section</b>	<b>Context</b>	<b>Comment</b>	<b>Response</b>
33	3.2 (point 8, first bullet)	Referring to “The perviousness of the site and natural drainage paths should be preserved to the extent feasible...”	knowing this is not practical while developing, the goal should be clarified.	Comment noted, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.
34	3.2 (point 8, second bullet)	Referring to “The rate of runoff should be slowed “	This is not necessarily true to maintain good stream ecology. wording would be reconsidered. Mixing of the volume and rate concepts should be avoided.	Comment noted, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.
35	3.2 (point 8, third bullet)	Referring to “Pollution control is best accomplished by implementing a series of measures, which can include source controls, minimizing directly connected impervious area, and construction of on-site and regional facilities to control both runoff and pollution”	Mixing of concepts?	Comment noted, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.
36	3.2 (point 8, third bullet, last sentence)	Referring to “...disconnection of impervious areas is one of the most effective means for reducing the pollutant load delivered to receiving waters”	should consider citing a source for this type of statement. That I know, this is not clear science since higher volumes have lower pollutant loading due to dilution.	Comment noted, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.
37	3.2 (point 9)	Referring to “...giving full consideration to downstream effects and the effects of offsite flows entering the system.”	do you mean run on? Maybe clarify	“offsite” here could also be called “run-on”, however it is not incorporated as the Principles text is intended to be re-written from MHFD verbatim.



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38	3.3 (page 22, point 2)	Referring to “Require implementation of solutions for potential drainage impacts....”	Local/on-site? and what constitutes a site. Should be at the subdivision level. If a subdivision provides the infrastructure it should not then ALSO be required of a site within the subdivision, unless clearly defined up-front.	Comment noted, but not incorporated. The policy stands as written as drainage problems should not be transferred, either within an individual subdivision or elsewhere.
39	3.4 (page 24, point 4)	Referring to “Recognize that streets and roadways have the primary purpose....”	Would be great to have this read "dual purpose of serving traffic and drainage needs" recognizing this would best serve the financially responsible maintenance goals within the county.	Comment noted, but not incorporated. We believe the Policy statement is appropriate as is.
40	3.4 (point 5)	Referring to “.....redevelopment to provide aboveground stormwater detention....”	Why above ground? This seems to be a big problem for responsibly condensing the developed area and providing usable open space	Belowground detention facilities are generally more difficult to inspect and maintain and design for FSD. The County may allow belowground facilities in limited circumstances and subject to variance request.
41	3.5 (point 1)	Referring to “Development-wide stormwater conveyance facilities shall only be situated in an outlot, common area lot, or road Right-of-Way/Easement”	This requires that the HOA and/or metro district maintain the area above and will increase the costs to live in a community. It will also increase the private cost of infrastructure like fencing. The impact of this should be carefully considered before being implemented.	Comment noted, but not incorporated. The County does not maintain local subdivision infrastructure. There is not an increase to the private cost of maintenance as they are already required to do so. Metro districts are very uncommon in the County.

<b>Comment Number</b>	<b>Section</b>	<b>Context</b>	<b>Comment</b>	<b>Response</b>
42	3.5 (point 2)	Referring to “Property owners are responsible for maintenance of all stormwater management facilities located on their property unless another party accepts responsibility”	Shouldn't this be the easement owner or owner of the infrastructure in some cases? The Metro Districts often own the storm systems not owned by the County/municipality	Comment noted and addressed (for clarification) to state “The owners of all stormwater management facilities and infrastructure are responsible for maintenance unless it is documented that another party shall be responsible for maintenance.”
43	6.8	Referring to “Additionally, the County may require that a drainage easement be acquired for the areas where offsite flows are conveyed”	If there is a possibility that this requirement restrict the development of a property because a downstream user will not grant an easement, the prescriptive easement should be considered acceptable.	Comment noted, but not incorporated. The County cannot commit to this suggestion for legal reasons. Such situations will be addressed on a case-by-case basis.
44	6.10	Referring to header “Submittal Requirements”	Define what is required at preliminary vs. final. Preliminary should be feasibility only and not require detailed sub-basin analysis.	The requirements of preliminary vs. final are outlined in Chapter 2 and the corresponding checklists. Responses to similar comments are also provided above.
45	7.1	Referring to “The primary function of streets and roadways is to provide safe traffic movement, therefore stormwater drainage and conveyance in streets must be designed to prevent or minimize interference with that objective”	should reconsider this language due to perception is creates and resulting in the high cost of maintenance that not recognizing dual purpose of roads creates. This can affect the affordability of housing.	Comment noted, but not incorporated. As discussed further in the paragraph, the criteria/standards are based on a balanced approach between traffic and drainage. These criteria/standards are consistent with other cities/counties. It is unclear how addressing the comment would reduce costs.

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46	7.4	<i>Referring to the paragraph and tables</i>	It should be recognized that restricting these major conveyances and cross-pan flows this far will significantly increase infrastructure maintenance costs over time.	Comment noted. The County disagrees with the comment, and responses to specific comments are provided below.
47	7.4	Referring to “Encroachment criteria for the minor storm event (Table 7-2) and major storm event (Table 7-3) are presented below”	Should clarify that this is for flow traveling parallel to the road, not necessarily sheet flowing off.	Comment noted, but not incorporated. The criteria can also apply to cross-street (perpendicular) flow where cross-pans are not allowed. It is also generally understood such criteria are not applicable to sheet flowing off.
48	7.4 (table 7.3 “Local” row)	Referring to “Buildings shall have at least 18” of freeboard*.	this can be super problematic in alley load situations. Really should reconsider this or clarify that this doesn't apply to runoff developed from onsite in alleys as it could eliminate an entire product line from Larimer county but isn't used in many places.	Comment noted, but not incorporated. This situation is uncommon in the County and may be handled through the variance process if necessary.
49	7.4 (table 7.3 “Major Collector & Arterial” row)	Referring to “Buildings shall have at least 18” of freeboard*.	Clarify that this is to the water surface in the street	Comment noted and addressed. Footnote is modified to read “Freeboard requirements are based on the water surface elevation in the street/roadway”.

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50	7.4 (table 7.4 “Major Collector & Arterial” row)	Referring to “No cross flow allowed”	Many if not all roads require cross-pans at intersections with other crowned roads in order to properly drain the pavement. This criteria will likely require all larger intersections to be tilted planes where one curb is higher than the other in order to have warrant-able pavement slopes. This should be seriously reconsidered for collectors or there will be extremely high storm infrastructure costs.	Comment noted, but not incorporated. Cross-pans will not be allowed across major collections/arterials, which is consistent with the Larimer County Urban Area Street Standards and many other stormwater standards/manuals.
51	7.6 (second bullet”	Referring to “Drawing plans shall include cross-sections showing maximum extents of encroachment, flow depths and water surface elevations, and”	Clarify what is required at preliminary vs final. Detail will not be available for much of this until final.	Comment noted. Requirements for preliminary vs. final are identified in the checklists. The intent of this section is to identify for the user (up front) what the most common submittal requirements will be.
52	8.2	Referring to “The most common inlets used in the County are Type R, Type C and Type 13”	Duplicate statement from above. Clarify Type-13 valley vs. Type 3 combo inlet with type-13 grate	Comment noted and addressed as follows: Duplicate statement is removed. Further clarification on inlet types is not necessary as this information is not important to adhering to any standards.
53	8.2 (table 8-1, “Curb-opening” row	Referring to “Do not clog easily and are bicycle safe	Not exactly true given the 3" depression in the gutter pan require.	Comment noted. Reference to “bicycle safe” is removed, but does not change any applicable Standards.
54	8.4	Referring to the whole paragraph	Most of this information, if not all, should be deferred until final design reports except in rare cases	Comment noted. As previously stated, detailed submittal requirements are outlined in the checklists.

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55	9.1	Referring to “This chapter provides design criteria and procedures for storm drains in the County”	should clarify this as public so there is no confusion about landscape drains and nuisance systems	Agree. Text will be modified to state “This chapter provides design criteria and procedures for all storm drains within the County public right-of-way or easements.”
56	9.1 “Rural Areas” box	Referring to “Projects that propose to include storm drains in rural areas should be discussed....”	Clarify that this doesn't include culverts	Agree. Text will be modified at the end of the call-out box to state “(Note: culverts are not considered storm drains in this context)”.
57	9.2	Referring to “Polyvinyl chloride (PVC) and high-density polyethylene (HDPE) may be used for private storm drains with prior <b>approval</b> from the County Engineer”	Add HP (Polypropylene) pipe and hope that you consider it for public use too.  Approval for private plastic pipe should be a given.	Comment noted. The County will not allow polypropylene pipe for public storm drains.  The statement regarding approval of private storm drain material will be removed.
58	9.3	Referring to “Manholes are required at all pipe junctions (including laterals servicing inlets)...”	Should only apply to public systems. landscape drains are storm drains and should not have manholes.	Comment noted and addressed in previous response limiting these Standards to public storm drains.
59	9.4	Referring to “Storm drain outlets shall have a headwall/wingwall or flared end section.....”	exclude small systems since those should be able to go to infiltration systems or pop-up emitters	Comment noted and addressed in previous response limiting these Standards to public storm drains.
60	9.5 (page 47)	Referring to “ The minimum cover for any storm drain....”	Exclude private like landscape storm drains. French drains/slotted pipes for lot lines for example.	Comment noted and addressed in previous response limiting these Standards to public storm drains.

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61	9.6	Referring to “ Storm drains shall be designed to convey the minor storm at 8-% or less of full pipe capacity...”	Again this should be for public systems only.	Comment noted and addressed in previous response limiting these Standards to public storm drains.
62	9.6	Referring to “A minimum velocity of 3 ft/sec...”	This has always been 2ft/sec. Why the change?	Standards/criteria generally vary between 2-3 ft/second. The comment has been addressed by changing to 2 feet/second.
63	9.6	Referring to “The EGL shall be 6 inches or more below the manhole lid elevation...”	This is problematic at inlets since the HGL is above. Also, should provide a way for there to be a storm sewer in a street where the major storm is conveyed on the surface. This is very expensive otherwise or requires orifice plates within the inlets.	Comment noted, but not addressed. Storm drain capacity calculations are generally conducted separately from surface (street and inlet) calculations. The storm drain EGL requirements are intended to prevent manhole displacement and, where inlets exist, allow for surface runoff to enter the storm drain. The County does not intend for orifices to be placed in inlets, nor intend for all runoff to be conveyed in storm drains (for the major event). The majority of other criteria/standards manuals are written with similar requirements.
64	9.6 (Table 9-1, “Pipe material” row)	Referring to “RCP Class 3 or greater (in public ROW or easement)”	Should consider Polypropylene as allowed by Fort Collins and CDOT	Comment noted and addressed in previous response.

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65	9.6 (Table 9-1, "Velocity" row)	Referring to "Minimum velocity of 3 ft/sec..."	Why not 2 as this normally used.	Standards/criteria generally vary between 2-3 ft/second. The comment has been addressed by changing to 2 feet/second.
66	9.6 (Table 9-1, "EGL" row)	Referring to "≥ 6 inches below manhole lid..."	Again, problematic. Very expensive and forces major storm flow underground. Should be conveying major storms on the surface as much as possible to make systems financially sustainable to maintain	Comment noted and addressed in the response above.
67	9.8	Referring to whole paragraph	Likely all of this should just be at final design report, not preliminary	Comment noted and responses to similar comments have been provided above.
68	10.2.1	Referring to the "No Adverse Impact" box.	Is this intended to encompass driveway culverts? should clarify if not. Table 10-1 says 6" overtopping which doesn't comply.	Yes, this statement applies to driveway culverts and is noted as such in Table 10-1.
69	10.2.3 (Table 10-2)	Referring to the table.	What about polypropylene as allowed by CDOT? Is PVC not allowed at all?	Comment noted and addressed in the response above.
70	10.2.6	Referring to "Culverts shall be designed with a minimum velocity of 3 feet per second"	Why not 2?	Here, 3 ft/s is appropriate to limit accumulation of larger debris.
71	10.4	Referring to bullet points	What is prelim vs final? Should be able to omit quite a bit in prelim.	Comment noted and responses to similar comments have been provided above.
72	11.4	Referring to bullet points	Prelim vs. Final requirements	Comment noted and responses to similar comments have been provided above.

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73	12.0	Referring to chapter	Another definition should be included since the word "swale" is used for the conveyance around a home or along a lot line between two houses. the freeboard requirements cannot apply to these and still work for construction and building code compliance. Small conveyances through open spaces should also be exempt from "swale" standards.	Comment noted, but not addressed. The County recognizes there are practical differences between swales that convey runoff from relatively small contributing areas (e.g., between households) and those can convey runoff from larger contributing areas. The County does not intend to apply the Standards to swales with such relatively small contributing areas, however setting a specific threshold is difficult due to the range of potential circumstances that can arise. Swales that must meet the Standards will be identified during preliminary review.
74	12.2.2	Referring to whole paragraph	Clarify where this is applicable. A swale around the back of a home or collecting runoff around a commercial/multi-family building can not/should not be included in this requirement.	Comment noted, but not addressed. See response to comment above.
75	12.2.3	Referring to whole paragraph	swales at lotlines should be unnoticeable so defining a shape is problematic.	Agree. It is not the County's intent for these Standards to apply to small swales. See response to comment above.
76	12.2.5	Referring to whole paragraph	This can't occur for lot line swales, those around homes or those needed for building code compliance around multi-family.	Agree. The related policy statement refers to "development-wide" swales.
77	12.6	Referring to bullet points	Prelim vs final requirements should be different.	Comment noted and responses to similar comments have been provided above.



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78	14.4	Referring to paragraph	Clarify if you consider a retention pond that is shown to infiltrate in the appropriate amount of time a "detention" or "retention" pond. Infiltration ponds are used frequently when there is no outfall in rural towns.	A "retention pond" is one that retains a relatively permanent water volume and thus is subject to "losses" to evaporation. An "infiltration pond" is different and not explicitly included in these Standards as they are not typically used for detention. An infiltration pond may be approved by the County through a variance request.
79	14.4 (table 14-1, "Retention Ponds" row)	Referring to "Retention ponds are <u>not allowed</u> "	Clarify per above.	Clarification provided in response above, but not incorporated into the Standards.
80	14.7	Referring to paragraph	Clarify that "freeboard" within the pond is from the pond 100-year water surface for the capacity of the pond and from the water surface of the emergency overflow for buildings above the pond.	The Storage chapter of the MHFD Manual states freeboard requirements for the pond embankment (1 ft minimum).  The Standards have been revised to include the following statement regarding freeboard requirements:  "The lowest floor elevation for buildings adjacent to a storage facility must be higher than the embankment crest elevation of the storage facility."
81	14.9	Referring to bullet points	Clarify what is preliminary. Should just be total cumulative volumes, proof of release rates and stage storages	Comment noted and responses to similar comments have been provided above.

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82	15.3 (page 78, Runoff Reduction Standard)	Referring to "...evaporation, or evapotranspiration of 60% of..."	Is this allowed by the state? or does this require water rights acquisition?	This is the state's MS4 permit language. The Runoff Reduction Standard is generally met primarily through infiltration, with minor evaporation/ET losses. An "evaporation pond" would likely require water rights acquisition/augmentation plan and would not be approved by the County.
83	15.3.1 (Table 15-1, page 80, "Underground (proprietary) SCMs" row)	Referring to paragraph	This reduces usable open space in dense areas. Is this the intent?	No, the intent is to limit the use of these facilities where all other options are not feasible, and would require a variance request/review. The County disagrees with the comment that implies aboveground SCMs/detention reduces "usable open space".
84	15.3.4	Referring to paragraph	Prelim vs final	Comment noted and responses to similar comments have been provided above.
85	Chapter 12 – Open Channels	General	I would like to suggest HEC-15 as an industry standard method for hydraulic calculations for swales and roadside channels for both vegetative and lined channels using permissible shear stress methodology. The output gives a more realistic Manning's n value because it's computed iteratively as a function of flow depth.	Agree. While the draft version of the Standards do allow for alternative methods (with approval from County Engineer), we can add it as a recommended method.

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86	Chapter 6 - Runoff	General	<p>I also wanted to mention that HEC-RAS Rain on Grid is listed at the top of the FEMA accepted Hydrologic models.. not that the order necessarily means anything, not sure.</p> <p>I am using this a lot now in different study areas in the US.. and to initially suss out flow conditions on regular civil projects also.</p> <p>It has Green Ampt as one of the Infiltration options.. I use that and have found it mirrors EPA SWMM 5 closely.</p>	<p>Comment noted, but will not be incorporated. The Standards allow for applicants to submit alternative methods, with approval from the County Engineer.</p>

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87	Chapter 4 - Floodplains	General	<p>It could be helpful to differentiate between detailed and approximate floodplain studies for no-rise permitting, and to provide some language in the standards for exactly when CLOMR/LOMRs become necessary. I suspect that this language could be elsewhere within other standards referenced by the County, so please disregard this if I'm off base. Also, it might be possible that the County is getting away from approving approximate study FDPAs for any projects that show a rise (even if it's less than 0.3'), and I might just not be aware of it.</p> <p>Anyways, it could be beneficial to state that water surface elevations changes can be +/-0.3' in an approximate overlay without precipitating the need for a CLOMR, as long as there's no insurable structures involved, whereas any rise in a detailed overlay would require a CLOMR. It also may be helpful to state somewhere that a LOMR isn't needed unless the post-project water surface elevations drop more than -0.3' (in detailed or approximate flood overlay zones), or something</p>	<p>Comment noted, but not addressed. These comments are appropriate to be included within the County's Floodplain Permit Guidance Document.</p>

Comment Number	Section	Context	Comment	Response
88	Section 4.5.5	The FRB....makes recommendations to the County Engineer regarding variance requests..	My understanding is that the FRB is moving away from reviewing variance requests, and that Mark P. will now be reviewing/approving them directly. Is this correct? We permitted Wildsong Road on the Buckhorn late last year and were asked to remove variance request language from our design/permitting memo – my understanding was that material is no longer relevant for the FRB.	Comment noted. The flood review board role has remained consistent and will not be changed with these Standards.
89	Chapter 15 – Post-Construction Stormwater Controls	General	Does the County have a plan, in addition to requiring a O & M manual at the development phase, to help educate, inspect and assist property owners keep these systems functioning?	No.
90	Chapter 15 – Post-Construction Stormwater Controls	General	Does the County's design review staff (inhouse or consultant) have experience in reviewing LID design for maintenance requirements?	Yes.

Comment Number	Section	Context	Comment	Response
91	Chapter 15 – Post-Construction Stormwater Controls	General	Would the County be open to an annual self inspection program that would require private property owners/managers to either learn what is required or hire a certified inspector (third party) to complete routine inspections and send them in to the County for concurrence? This inspection program could help trigger routine maintenance to keep the system functioning.	Not at this time.