

MEMO
HUMBOLDT COUNTY
DEPARTMENT OF PUBLIC WORKS
LAND USE DIVISION

TO: Thomas K. Mattson, Director

FROM: Robert W. Bronkall, Associate Engineer

DATE: 10/22/2009

RE: **SUMMARY OF RESPONSES FROM VARIOUS CALIFORNIA
COUNTIES ON THE STORM WATER DETENTION/INFILTRATION
BASIN SURVEY**

On January 26, 2009, through Kiana Buss at California State Association of Counties, a survey on storm water detention basins was sent to member counties. I received 15 responses. The Land Use Division has compiled the responses and we have included Humboldt County's response as well.

The survey consisted of the following questions:

The County of Humboldt is working towards establishing standards for the design of storm water detention basins and storm water infiltration (retention) basins. Please send me copies of any policies, standards, codes, details, etc. that you have related to both detention and infiltration basins.

In particular, we are interested in:

- 1. The intensity and length of the design storm(s) that are used for sizing the basin*
- 2. The time gap allowed for the basin to drain before the next storm event begins.*
- 3. The required (or preferred) software used for modeling the basins*
- 4. Methods used to determine percolation rates for infiltration basins*
- 5. Allow for the use of "void space" between rocks to achieve the required storage volume in underground systems such as storm tech. (<http://www.stormtech.com/>)*

SUMMARY OF RESPONSES FROM VARIOUS CALIFORNIA COUNTIES ON THE STORM WATER DETENTION/INFILTRATION BASIN SURVEY

January 2009 Survey by the County Of Humboldt Department of Public Works

Contact: Robert W. Bronkall 707.445.7205 bbronkall@co.humboldt.ca.us

COUNTY	FACILITY TYPE	(1) INTENSITY & DURATION		(2) TIME GAP TO DRAIN	(3) SOFTWARE PREFERENCE	(4) PERC RATE METHODS	(5) VOID SPACE	COMMENTS
		STORM INTENSITY	STORM DURATION					
Alameda	Detention	100 yr	24 hrs	24 hrs	Bentley Pond Pack	ULR per SCS	DNA	No attachments forwarded.
Butte	Trench	10 yr	24 hrs	DNA	Rational Method	Per Env.Health Requirements	33%	Only allowed where impossible to connect to a permanent drain system.
	Detention	10 yr	24 hrs	DNA	Excel spreadsheets	N/A	N/A	1.5 feet of freeboard for 10 year; full containment for 100 year
100 yr								
Contra Costa	$A \leq 1 \text{ mi}^2$	10 yr	3 hr	70%@24 hrs 100%@48 hrs	HEC-1 HEC-GeoHMS EPA SWM5 BFlow _{fortran}	DNA	DNA (working on)	Underground detention design standards (10/2008 DRAFT) Maximum water surface elevation > 15 inches below 100 year elevation 2 feet of freeboard
	$1 \text{ mi}^2 < A < 4 \text{ mi}^2$	25 yr	6 or 12 hr					
	$A \geq 4 \text{ mi}^2$	100 yr	6 or 12 hr					
El Dorado	Detention	100 yr	Sect. 2.3.1	72 hrs	HEC-GeoHMS	N/A	N/A	http://www.co.el-dorado.ca.us/dot/pdf/DrainageManual.pdf Retention allowed only with specific approval from County. Approval requires submittal of an acceptable long-term maintenance and public safety plan.
	Retention	100 yr		N/A		Not specified		
Humboldt	Detention	100 year	$3 \times t_c$	None	Rational Method	N/A	N/A	Basins must retain Q_{100} post development flow while only releasing Q_2 pre development flow
	Infiltration Trench	100 year	$3 \times t_c$	None	Rational Method	Use County Environmental Health Standards	Up to 50% allowed	Infiltration rates must be verified by wet weather testing in accordance with County Environmental Health Department requirements for leach field testing.
Merced	Detention	10 yr	24 hrs	48 hrs 5 days ¹	By hand or spreadsheet ²	Reqs. field testing	DNA ³	¹ -Larger basins required to be 30% larger (than required capacity?) ² -Any software should graphically produce the hydraulic gradeline. ³ -underground systems rarely used in Merced County
Nevada	Detention	10 yr	24 hrs	24 hrs	HEC-1	DNA	DNA	
Placer County	Detention	Post 2 yr Post 10 yr Post 100 yr	$\geq 4x$ response time of watershed	72 hrs except Tahoe 24 hrs	HEC-1 for large water sheds; Δ hydrographs for small watersheds	SCS curve numbers	Infiltration not considered due to fines.	Duration/intensity depend on elevation and design inlet/outlet criteria.

LEGEND:

DNA = Did Not Answer

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		STORM INTENSITY	STORM DURATION					
Sacramento	Detention	Sacramento Method varies both storm frequency and duration times.		Basins tend to drain quickly.	HEC-HMS, <i>also</i> : Pond Pack, AES, etc.	Field perc preferred NRCS for planning purposes only	Per manufacturers recommendations.	The Sacramento Method explained: http://www.msa.saccounty.net/waterresources/drainage/vol2/V2_Chap04.PDF
San Diego	Detention <1 mi ² Det.	100 yr	6 hrs	72 hrs	By hand, HEC-1, HEC-HMS, etc,	Site soil analysis to est. perc rates ¹	N/A	Where drainage area <1 mi ² rational method converted to a hydrograph. ¹ - Infiltration generally not considered in San Diego due to prohibitive soil types.
	Detention >1 mi ² Det.	100 yr	24 hrs					
San Luis Obispo	Detention	50 yr	10 hrs	7 days max.	≤200 ac. Rational >200 ac. NRCS method	Field testing required	25% (40% if clean) ¹	Max. Q _{OUT} = 2 year pre-development condition. ¹ -40% if gravel is clean, ¾" to 2" in size
San Mateo	Small sites	10 yr	10 min	No requirements	Hand calculations	Flow thru systems ok	Do not consider	Post development flow rate and velocity cannot exceed pre-existing flow rate and velocity. ¹ -Per San Mateo County C.3 Stormwater Technical Guidance document
	Flood zone	100 yr	>10 min	48 hrs ¹	Bay Area Hydrology Model	Field testing required		
Santa Cruz	Retention	2 yr	2 hr	48 hrs	<200 ac. Rational Method >200 ac. UHM, NRCS, USGS, etc.	Use NRCA data or field perc test	35% ¹	¹ -Require uniformly graded gravel for the backfill material Detention required = $Q_{10\text{ yr} - \text{POST}} - Q_{10\text{ yr} - \text{PRE}}$; $t_c = 15\text{ min}$; 25% SF
	Detention	2 yr	1 hr					
Siskiyou								No standards have been adopted. However, developers must demonstrate no net increase in run-off.
Solano County								Solano County ordinance states the rate of runoff must remain constant for all development creating an impervious area 5,000 square feet or greater. No standards have been adopted.
Yuba	Detention	Varies	Varies	No current policy	Formula	Field verify percolation rate	DNA	

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