



Flood Control
& Water Conservation District

FREQUENTLY ASKED QUESTIONS
For

DEVELOPERS AND ENGINEERS

Last Revised May 5, 2010

Introduction:

The following questions have been organized in the categories below. We have attempted to group the questions from more general to more specific/technical in nature. Each group of questions is in a different file. You should go to the file that appears to relate best to your question.

Frequently Asked Questions for:

- [Drainage, Watershed and Water Quality](#)
- [Property Owners Near Creeks](#)
- [Developers and Engineers](#)
and
- [Definitions of Terms](#)

If you have questions that you cannot find in this document, please call the Flood Control District at (925) 313-2000 and ask for the Flood Control. Someone will do their best to address your question.

In the PDF version of this document, the Table of Contents can be used to jump to the responses to the questions. Use the “Navigation” toolbar to jump back to the List of Questions.

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Water Conservation District¹**

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<http://www.co.contra-costa.ca.us/depart/pw/floodcontrol/Flood.html>

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¹ The Flood Control District is in the County Public Works Building

List of Questions

Introduction:	2
1. Where can I find your design standards?.....	4
2. What is the design storm for my project?	4
3. Do you have the flow rate at a specific location on a creek?.....	4
4. Why does the flow rate I find in a FEMA report not match the flow rate I was given by Flood Control?	4
5. There is no Flood Control data point where I need it or I need to know the post development design flows for my project. How do I calculate those flows?.....	5
6. Does the Flood Control District have jurisdiction over the creek I'm designing (in or around) and do I have to follow District standards?	5
7. Can I use the SCS (NRCS) unit hydrograph method for my project in Contra Costa County?	5
8. I know there is a FEMA flood plain study. Does the Food Control District have the creek model (HEC-1, HEC-RAS) that I can use to find out the water surface elevation?	5
9. The date on the Isohyet map and Duration Frequency Depth curves is 1977. Are these documents up to date?	6
10. My property is located in DA "X," but there is a closer facility in DA "Y," Can I connect to DA "Y" facility since it is closer to my project?	6
11. I need to construct an outfall to a creek. What kind of permit do I need?.....	6
12. I need the water surface elevation in a creek or existing storm drain system. Where do I get the information I need on starting water surface elevation and flow rate?	6
13. I am designing a bridge to go over a creek. What are the criteria to design the elevation of the low chord of the bridge?.....	7

DEVELOPERS AND ENGINEERS

1. Where can I find your design standards?

At the time these FAQs were published, the District was preparing a document to bring all its standards into one document. You may find the standards on-line at <http://www.co.contra-costa.ca.us/depart/pw/floodcontrol/Flood.html>. If not, call the District office at (925) 313-2000 and ask for someone in Flood Control.

2. What is the design storm for my project?

The County Title 9 (Title 9: 911-2.010) set the design storm based on the watershed area draining to the creek of drainage facility as follows:

Area < 1.0 sq. mi. Contain, with sufficient freeboard, a ten year frequency of average recurrence interval (10-year)

1.0 sq. mi. ≤ Area ≤ 4 sq. mi. Contain, with sufficient freeboard, a 25-year frequency of average recurrence interval (25-year)

4.0 sq. mi. ≥ Area Contain, with sufficient freeboard, a 50-year frequency of average recurrence interval (50-year)

OR

Contain the 100-year frequency of average recurrence interval (100-year)

3. Do you have the flow rate at a specific location on a creek?

The Flood Control District has over 2,000 data points where the flow rates have been calculated. Most of these are the “design” flow rates based on General Plan build out². Depending on the watershed size, the flow rate could be for the 10-year, 25-year, 50-year or 100-year flood. For information on the flow rates that the Flood Control District has for these data points call the following number:

County Public Works Department, Flood Control Division – (925) 313-2000

4. Why does the flow rate I find in a FEMA3 report not match the flow rate I was given by Flood Control?

The Flood Control District normally calculates “design” flow rates that depend on the watershed size, and are based on the projected General Plan land uses in the County and City general plans. FEMA studies are based on existing land uses. Because some watersheds are not built out to the General Plan land uses, the FEMA flow rates are likely

² “Build Out” is a term used to describe development of land to the extent allowed under a plan. In this case it is the County and City General Plans. “Build Out” could also be used to describe the completion of a master planned community development or large subdivision with several phases.

³ FEMA – Federal Emergency Management Agency

smaller. In addition, some FEMA flow rates may not match the District flow rates because they were not directly calculated by the District but are estimated by the engineering company performing the FEMA study. Also, the FEMA report could be out of date.

5. There is no Flood Control data point where I need it or I need to know the post development design flows for my project. How do I calculate those flows?

If the watershed is small, you can use the Rational Method to calculate the design flow rate. If the area is large or you need hydrographs for designing a detention basin, the Flood Control District can calculate the hydrographs for you. You need to request a HYDRO6 submittal package. There is a fee for the District to calculate the flows for you. Contact the Hydrology Section at the number below and they can e-mail the HYDRO6 instructions and submittal package to you. You may also purchase the submittal package at the front counter of the Public Works Department office.

6. Does the Flood Control District have jurisdiction over the creek I'm designing (in or around) and do I have to follow District standards?

The District boundaries cover all of Contra Costa County. Within District right-of-ways the District can dictate hydrology methods and freeboard standards. The County has adopted our standards and so in the unincorporated areas our standards are used. FEMA will require you to use the FCD flow rates in any FEMA study. The District can generate the flow rates using the Hydro program.

7. Can I use the SCS (NRCS) unit hydrograph method for my project in Contra Costa County?

The Flood Control District does not use the SCS unit hydrograph method and will not accept the SCS method for use in FEMA studies or facilities managed by the District.

The District uses a method developed and used by the US Army Corps of Engineers. The District chose this method in the early 1970s because the results of comparing the methods to recorded rainfall and runoff amounts showed that the Corps of Engineers method (call the "S"-curve Method, or LA Method) provided better results. The "S" curve (dimensionless cumulative unit hydrograph) for the method and the equation for T_{lag} were calibrated for Contra Costa County.

8. I know there is a FEMA flood plain study. Does the Flood Control District have the creek model (HEC-1, HEC-RAS) that I can use to find out the water surface elevation?

The Flood Control District does not perform the FEMA studies, however our Hydrology Section does provide the flow rate information used in the studies. You will have to contact FEMA [or their engineer, Michael J. Baker Corporation at (703) 960-8800] to get a copy of the model.

9. The date on the Isohyet map and Duration Frequency Depth curves is 1977. Are these documents up to date?

The Flood Control District has reviewed the data collected since the documents were created and found no significant changes in the statistics that would warrant revising those documents. We do plan to review them in the next few years as we update our procedures and review the data sources. Because they were based on long term records (30-100 years) any changes would be expected to be minor.

10. My property is located in DA “X,” but there is a closer facility in DA “Y,” Can I connect to DA “Y” facility since it is closer to my project?

No. The drainage facilities in DA “Y” were designed for a flow rate that only included the areas in DA “Y.” Diversion (direction of runoff from one drainage area to another) is prohibited unless there is an equal drainage area swap.

11. I need to construct an outfall to a creek. What kind of permit do I need?

For an outfall into a creek in Flood Control Right-of-way, you need to get a Flood Control Encroachment Permit.

For an outfall into a private creek, even in your backyard, you need to get:

- a. County or City Drainage Permit
- b. Fish and Game Streambed Alteration Agreement
- c. Regional Board Permit
- d. US Army Corps of Engineering’s Permit

Contact information for the permitting agencies can be found elsewhere in the FAQs.

12. I need the water surface elevation in a creek or existing storm drain system. Where do I get the information I need on starting water surface elevation and flow rate?

The Flood Control District has some starting water surface information for their facilities and many major channels. However, not all of the information is up-to-date and most will need to be verified by new open channel modeling. Other sources of information include:

- e. FEMA (You will have to contact FEMA [or their engineer, Michael J. Baker Corporation at (703) 960-8800] to get a copy of their models.
- f. City Public Works Departments
- g. Engineers of adjacent projects

Be aware that FEMA models and flow rates are usually for the 100-year storm and above and are based on **existing** conditions. You maybe required by the Flood Control District, City or County to use starting water surface elevation based on flows calculated with the assumption of **General Plan** build out conditions.

13.I am designing a bridge to go over a creek. What are the criteria to design the elevation of the low chord of the bridge?

Over its facilities, Flood Control requires the bridge to pass the 100-year water surface or the 50-year water surface plus freeboard. An additional 1 foot is usually required under bridges to allow for floating debris. However, in some cases where a chance of floating debris from upstream exists, additional freeboard may be required. Each situation is considered on a case-by-case basis.

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