



CITY OF  
**ARROYO GRANDE**  
CALIFORNIA

**Hydrologic and Hydraulic Analysis Report Guidelines**  
**October 19, 2015**

A Hydrologic and Hydraulic Analysis Report provides analysis on existing conditions and proposed improvements in order to determine whether if those proposed improvements have reasonably accounted for floodwater/rainwater flow for the project site and surrounding areas. This type of Report is required due to development of land or when changes are proposed to existing drainage patterns.

The Hydrologic and Hydraulic Analysis Report must include a complete analysis of proposed improvements and supporting documentation including computations and any relevant information that may assist in the review process. The Report must be prepared, signed and stamped by a Civil Engineer who is registered in the State of California. At a minimum, the following information must be included in the Report is considered as the minimum for inclusion in the drainage study submittal.

Introduction and Background

The introduction and background must consist of a discussion of the proposed project including existing conditions and a description of the project site including a location map. Include discussion within the introduction and background section on:

1. the purpose and scope of the drainage study;
2. the proposed methodology for the analysis;
3. existing drainage problems including bank stability problems;
4. proposed alterations to existing drainage features; and
5. constraints that influence selection of available alternatives.

Location Map/Description

A discussion of the project area including a map identifying the location of the proposed project must be included in the study.

Watershed Description/Delineation

The catchment tributary to project improvements and to downstream facilities being analyzed must be delineated on mapping sufficient to identify the parameters utilized in the analysis. Scale and detail must be sufficient for the level of analysis. A base map created from information on a U.S.G.S. 7.5 minute quadrangle map will be considered as minimum required for the submittal. The map must show all points of flow concentration and sub-basins, and must utilize a numbering system for these that is consistent with that used in the drainage calculations.

Hydrologic Analysis

The hydrologic analysis must include a presentation and discussion of the results obtained by the analysis and calculations performed. Calculate peak flow rates at each point of concentration for the 2-year, 10-year, 25-year, 50-year and 100-year precipitation event.



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Provide flow hydrographs for watersheds over 100-acres. Provide narrative and supporting assumptions such as runoff coefficients, times of concentration or lag times, channel routing assumptions, etc.

## Hydraulic Analysis

The hydraulic analysis must include a presentation and discussion of the results obtained by the analysis and computations performed.

## Risk Assessment/Impacts Discussion

At a minimum, an evaluation of the significance of computed discharges with respect to flood protection, flood damage and impacts on the stability of the drainage system must be included in the Report. Vulnerability of exposure must be determined and proposed improvement levels of protection must be justified. A discussion of any potential catastrophic losses, including associated value, must be adequately discussed when applicable.

## Enhancement/Mitigation

Proposed mitigation measures to onsite impacts and downstream drainage facilities, including riparian planting, bank stabilization, and in-stream aquatic enhancement structures must be specifically discussed.

## Unusual or Special Conditions

Any unusual or special conditions must be discussed in the Report. These include those related to existing facilities, physical or hydrological characteristics or the catchment and unusual or special requirements of the existing or proposed drainage system such as those related to operation or maintenance. Description of any special permits or special conditions required from regulatory agencies other than the City for the construction of proposed drainage improvements must be thoroughly discussed in the Report.

## Conclusions

A conclusion section must be included in the Report. Outcomes resulting from the proposed improvement analysis must be summarized and proposals, recommendations and requirements must be identified and adequately discussed.

## Technical Appendix of Supporting Documentation for Calculations

A technical appendix must be included in the Report that includes documentation of the analysis, any reference materials, documentation of parameter estimations used in the analysis, historical data used in the analysis, worksheets, completed water surface profiles, cross section information and flood plain mapping, and soil boring logs and laboratory data. The appendix will be reviewed as the complete technical support data package.