



Section 2
DRAINAGE PLANNING
SUBMITTAL REQUIREMENTS

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2.1 REVIEW PROCESS

All subdivisions, planned unit developments, or other development proposals shall submit drainage reports, construction drawings/specifications, storm drain CAD files, and as-built information in accordance with the requirements of this section. Digital copies shall be submitted to the City of Hemet.

Photostatic copies of charts, tables, nomographs, calculations, or any other reference material shall be legible. Blurred or unreadable portions of the report are unacceptable and could warrant resubmittal of the report. The submittal shall include a declaration of the type of report submitted (i.e., Preliminary or Final). Incomplete or absent information may result in the rejection of the report.

A pre-application conference with a representative of the Public Works Department is recommended for all applicants prior to submittal of a Preliminary or Final Drainage Report. At this meeting, general information regarding development regulations, required procedures, possible drainage problems and solutions, and specific submittal requirements for the subject site will be discussed. When the only development approval required is a building permit, this conference will provide information as to whether or not a Preliminary and/or Final Drainage Report will be required by the Public Works Department.

2.2 PRELIMINARY DRAINAGE REPORT

A Preliminary Drainage Report, is the first step in the approval process. A preliminary Drainage Report is required to be submitted as part of any development project (unless specifically waived). This report is intended to determine the feasibility and design characteristics of the proposed development, at a conceptual level. However, those problems that exist on site prior to development must be addressed within the preliminary report.

The report shall include a cover sheet and shall be prepared or supervised by an engineer licensed in California. The report shall contain a certification which shall read as follows:

"I hereby certify that this report (plan) for the Preliminary Drainage design of (Name of Development) was prepared by me (or under my direct supervision) in accordance with the provisions of the City of Hemet Storm Drain Development Standards, Storm Drain Criteria and Drainage Design Manual for the owners thereof. I understand that the City of Hemet does not

and will not assume liability for drainage facilities designed by others."

Registered Professional Engineer

State of California No. _____
(Affix Seal)

2.2.1 Preliminary Report Contents

The Report shall be in accordance with the following outline and contain the applicable information listed:

- I.** Narrative
 - A. Introduction
 - B. Scope of project
 - C. Site description
 - 1. General information
 - 2. Vegetative cover
 - 3. Prominent geographic features
- II.** Hydrological Parameters
 - A. Hydrology Methodologies
 - B. Rainfall Data and Source
 - C. Soils Data and Source
 - D. Runoff Index and Land Cover Assumptions
 - 1. Ground Cover Condition
 - 2. Impervious Area
 - E. Approved Flow Rates/User Defined Conditions
- III.** System Schematic
 - A. Proposed Surface Improvements
 - 1. Streets/roads
 - a) centerline
 - b) right-of-way
 - c) curb and gutter
 - 2. Grading
 - a) contours/spot elevations
 - b) slopes
 - c) retaining walls
 - B. Proposed Flood Control Facilities
 - 1. Storm Drains
 - a) location/alignment
 - b) diameter
 - c) flow rate
 - d) right-of-way
 - e) outlet geometry

- f) catch basin location
 - 1) type
 - curb inlet
 - grated inlet
 - riser
 - size (length/depth)
 - intercepted/flow-by
- 2. Open Channels
 - a) location/alignment
 - b) cross section
 - c) flow rate
 - d) velocity
 - e) lining (earthen, rock, grass, concrete, etc)
 - f) side inlets
 - 1) geometry
 - 2) flow rate
 - 3) right-of-way
- 3. Detention/Retention Basins
 - a) Purpose of Basin
 - b) Basin Design Criteria
 - c) Mitigation Measure Requirements
- C. FEMA Flood Hazards
 - 1. Flood Hazard Zone
 - 2. Impacts to Flood Hazard
 - 3. Mitigation Measure

IV. References

All criteria, master plans, and technical information referenced in support of the drainage concept shall be identified or included as excerpts.

2.2.2 Drawing Contents

- A. General Location Map:** All drawings shall be 24" x 36" in size. A map shall be provided in sufficient detail to identify drainage flows entering and leaving the development and general drainage patterns. The map should be at a legible scale and show the path of all drainage from the upper end of any off-site basins to the nearest adequate outlet. The map shall identify any major facilities from the subject property along the flow path to the nearest adequate outlet, such as existing improved channel, regional detention facilities, culverts, and storm sewers. Basins and divides are to be identified and topographic contours are to be included.
- B. Floodplain Information:** An exhibit displaying the location of the

subject property shall be included with the report as outlined in Section 2.2.1. *All* major drainageways with a mapped floodplain or floodway shall have the limits of flooding shown and included in report drawings.

- C. Hydrology Map and Drainage Plan:** Map(s) of the proposed development at a scale of 1" = 20' to 1" = 200' on a 24" x 36" drawing shall be included. The plan shall show the following:
1. Existing topographic contours at 1 foot minimum intervals. In terrain where the slope exceeds 15%, the maximum interval is 10 feet. The contours shall extend a minimum of 100 feet beyond the property lines.
 2. All existing drainage facilities.
 3. Approximate flooding limits based on available information.
 4. Conceptual drainage facilities including detention basins, storm drain, swales, riprap, and outlet structures in the detail consistent with the proposed development plan.
 5. Major drainage boundaries and sub-boundaries.
 6. Any off-site feature influencing development.
 7. Proposed flow directions and, if available, proposed surface improvements and/or contours.
 8. A legend to define map symbols.
 9. A title block in lower right corner, north arrow and graphic scale.
 10. Seal and signature of a professional engineer.

2.3 FINAL DRAINAGE REPORT

The purpose of the Final Drainage Report is to update the concepts, analysis, and design details discussed in the Preliminary Drainage Report. Also, any significant change to the Preliminary concept must be noted in the Final Report.

The Final Drainage Report shall be submitted with an application for a grading permit. The Final Drainage Report must be reviewed and accepted by the Public Works Department prior to accepting the final development application for approval.

All reports shall be submitted digitally to the public works department.

The report shall include a cover letter presenting the final design for review and shall be prepared by or under the direction of an engineer licensed in California and certified as shown above in Section 2.2, Preliminary Drainage Report. The report shall also contain a developer certification sheet as follows:

"(Name of Developer)" hereby certifies that the drainage facilities for (Name of Development) shall be constructed according to the design presented in this report. I understand

that the City of Hemet does not and will not assume liability for the drainage facilities designed and/or certified by my engineer. I understand that the City of Hemet reviews drainage plans but cannot, on behalf of (Name of Development), guarantee that final drainage design review will absolve (Name of Developer) and/or their successors and/or assigns of future liability of improper design. I further understand that approval of the final development application and/or final development plan does not imply approval of my engineer's drainage design."

Name of Developer

Authorized Signature

The Final Drainage Report shall be prepared in accordance with the following outline and include the material completed as part of the Preliminary Drainage Report.

2.3.1 Final Report Contents

I. Narrative

- A. Introduction
- B. Scope of project
- C. Site description
 - 1. General information
 - 2. Vegetative cover
 - 3. Prominent geographic features
- D. Hydrology
 - 1. Methodology Used
 - 2. Input parameters
 - 3. Summary of calculations
- E. Hydraulics
 - 1. Methodology
 - 2. Input parameters (starting WSE, Manning's "n" values, etc.)
 - 3. Summary of calculations and facilities
- F. Conclusions/Recommendations

II. Hydrology Calculations

- A. Soils map
- B. Rainfall data
 - 1. Rational Method
 - a) Time of concentration
 - b) Runoff coefficients
 - c) Initial subarea
 - 1) Area 10 acres
 - 2) Length 1000 feet
 - 3) Change in elevation
 - d) Travel Time
 - 1) Street flow calculations
 - 2) Pipe flow calculations
 - 3) Channel flow calculations
 - 2. Synthetic Unit Hydrograph
 - a) Lag time
 - 1) Length of longest watercourse
 - 2) Length to the centroid of the area
 - 3) Average roughness coefficient
 - 4) Slope along longest watercourse
 - b) Unit time (25% to 40% of lag)
 - c) Area adjustment
 - d) Runoff index
 - 1) Vegetative cover
 - e) Low loss rate calculation
 - f) Storm duration

III. Hydraulic Calculations

- A. Street Flow
- B. Catch Basin Capacity
- C. Storm Drains
- D. Culverts Capacity
- E. Open Channel
- F. Inlet Capacity
- G. Intercepted and Flow-by Summary Table (if applicable)

IV. Hydrology Map (One for Rational Method and One for Unit Hydrograph Separately)

- A. Bar scale/north arrow
- B. Legend
- C. Title block
- D. Watershed identification
 - 1. Sub-area delineation
 - 2. Sub-area in acres
 - 3. Flow path
 - 4. Centroid (hydrograph only)

5. Incremental flow
- E. Proposed onsite improvements
 1. Streets
 2. Grading
- F. Storm flows
 1. Entering project
 2. Leaving project
 3. Major intersections

V. Drainage Facilities Map

- A. Bar Scale/North Arrow
- B. Legend
- C. Title Block
- D. Proposed Surface Improvements
 1. Streets/roads
 - a) centerline
 - b) right-of-way
 - c) curb and gutter
 2. Grading
 - a) contours/spot elevations
 - b) slopes
 - c) retaining walls
- E. Proposed Flood Control Facilities
 1. Storm drains
 - a) location/alignment
 - b) diameter
 - c) flow rate
 - d) right-of-way
 - e) outlet geometry
 - f) catch basin location
 - 1) type
 - curb inlet
 - grated inlet
 - riser
 - size (length/depth)
 - capacity
 - intercepted/flow-by
 2. Open Channels
 - a) location/alignment
 - b) cross-section
 - c) flow rate
 - d) velocity
 - e) lining (earthen, rock, grass, concrete, etc.)
 - 1) side inlets:
 - geometry

- flow rate
- right-of-way

VI. Hydrologic Soils Map

VII. Land Use Map

- A. Bar Scale/North Arrow
- B. Legend
- C. Title Block
- D. Watershed boundaries
- E. Proposed surface improvements

VIII. Rainfall Maps/Tables

IX. References

All criteria, master plans, and technical information referenced in support of the drainage plan shall be identified.

2.3.2 Drawing contents

- A. General Location Map (See Section 2.2.2):
- B. Floodplain Information (See Section 2.2.2):
- C. Drainage Facilities Map; Map(s) of the proposed development at a legible scale on a 24" x 36" drawing shall be included. The plan shall show the following:
 1. Existing and proposed contours at 1-foot maximum intervals. The contours shall extend a minimum of 100 feet beyond the property lines. The contour interval may be increased at the discretion of the City Engineer.
 2. Property lines and easements with their intended use shall be noted.
 3. Streets, indicating right-of-way width, flowline width, curb type, and approximate slopes.
 4. Existing drainage facilities and structures, including irrigation ditches, roadside ditches, crosspans, drainageways, and culverts. All pertinent information such as material, size, shape, slope, and location shall also be included.
 5. Overall drainage area boundary and drainage sub- area boundaries.
 6. Proposed type of street flow, such as vertical or combination curb and gutter, roadside ditch, gutter, slope and flow directions, and crosspans.

7. Proposed storm drains and open drainageways, including outlets, manholes, culverts, and other appurtenances, including riprap protection.
8. Proposed outfall point for runoff from the developed area and facilities to convey flows to the final outfall point without damage to downstream properties.
9. Routing and accumulation of flows at various critical points for the initial storm runoff listed on the drawing.
10. Volumes and release rates for retention or detention storage facilities and information on outlet works.
11. The location and elevations, if available, of all existing floodplains affecting the property.
12. Routing of offsite drainage flow through the development.
13. The definition of flow path leaving the development through the downstream properties ending at a major drainageway or facility.
14. A legend to define map symbols.
15. A title block in lower right hand comer.