

**INTERIM DRAINAGE DESIGN GUIDELINES**  
**PREPARED APRIL 2, 1998**

The following drainage design criteria have historically been utilized for the design of drainage facilities within the Town of Paradise. This is an attempt to provide designers with a written set of guidelines, prior to adoption of a full set of drainage design criteria by the Planning Commission and Town Council. These are intended to be the minimum acceptable standards, each site must be evaluated individually by the Engineer of Record. All calculations and improvement plans shall be stamped and signed by the Engineer of Record. All facilities shall be designed in accordance with generally acceptable engineering practices, the latest adopted Uniform Building Code (including grading provisions), and the following specific design criteria:

**Hydrology**

Method - Rational or TR-55.

Design Storm 2 Tables (attached).

Calculations shall include tributary area map(s), area calculations, time of concentration calculations, runoff coefficient calculations and all other pertinent assumptions and calculations.

Acceptable references are the Caltrans Highway Design Manual, latest edition, and Butte County Improvement Standards, 1991 edition.

**Setbacks**

All designs shall comply with the Onsite System setbacks listed in Table 3.1, Onsite Wastewater Manual.

**Minor Underground Storm Drain Pipes & Structures (24" Diameter and Smaller)**

Design to flow 10 year storm, fully developed site, without using available head.

Check design with 100 year storm, if significant damage is possible, upsize facilities.

**Major Underground Storm Drain Pipes and Structure (greater than 24" Diameter)**

Design to flow 100 year storm, using available head.

**Minor Channels (less than 100 acres tributary)**

Design for 10 year storm, with ½ foot freeboard.

Check design for 100 year storm, if significant damage is possible, upsize facilities.

Design shall include erosion control measures.

All channels greater than 6% slope shall be lined.

**Major Channels (more than 100 acres tributary)**

Design for 100 year storm, with 1½ foot freeboard.

Design shall include erosion control measures.

All channels greater than 6% slope shall be lined.

**Downstream Impacts**

All developments of 5000 square feet of developed area or greater shall be required to provide a drainage impact analysis of surrounding and downstream properties. This impact analysis should include all areas downstream where the project may have a significant impact.

**Detention Pond Design:**

Design storm inflow - 100 year storm, fully developed site.

Infiltration - rates must be substantiated with percolation test(s) or soil information.

Underground detention/infiltration ponds should incorporate slurry cut-off walls into design to reduce potential for flooding of nearby onsite sanitation disposal systems (see setbacks in Onsite Manual).

Outflow - 10 year storm, undeveloped state, using  $t_c$  based upon site characteristics. This outflow will be into an acceptable drainage facility. Provide calculations to justify the proposed discharge, and check downstream capacity of all street ditches, gutters, pipes and channels.

Spillway - design spillway to handle 100 year storm, assuming plugged outfall. The spillway discharge shall be lined, shall be into an acceptable drainage way or public street..

Design for 100 year storm, with 1.0 foot of freeboard.

Provide means of maintaining structure (recorded maintenance agreement or other methods as approved by the Town Engineer).