

# City of Tulare Design Guidelines



## SECTION D – STORM DRAINAGE

1. Storm drainage facilities shall be designed in accordance with the City of Tulare Storm Drainage Master Plan, dated July 2009 as prepared by Carollo Engineers, the City of Tulare Public Improvement Standards, City of Tulare Technical Specifications and this section.
2. Definitions:
  - a. Retention Basin: A basin designed to hold runoff indefinitely.
  - b. Detention Basin: A basin designed to temporarily hold runoff and slowly drain to another location (usually by pumping).
3. Hydraulic computations shall be based on the following design methods:
  - a. Rational Design Method ( $Q=CIA$ ) where:
    - $Q$  = Flow (c.f.s.)
    - $C$  = Runoff Coefficient (see Table D.1)
    - $I$  = Rainfall Intensity Factor (in./hr., see Figure D.1)
    - $A$  = Drainage Areas (Acres)Time of concentration values (travel time) for use in determining rainfall intensity factor shall consider overland flow, gutter flow, channel flow and pipe flow.
  - b. Other design methods as approved by the City Engineer.
4. Storm drainage conveyance facilities shall be designed for the following recurrence intervals:
  - Tributary Area  $\leq$  160 Acres: 5 year storm recurrence interval.
  - Tributary Area  $>$  160 Acres: 10 year storm recurrence interval.
  - Master Plan Facilities: 10 year storm recurrence interval.
5. Storm drain piping shall be designed to have a minimum flow velocity of 2.5 ft./sec. under flows from the design storm recurrence interval.
6. Storm piping shall convey the flows for the storm recurrence interval assuming the storm basin is filled to 50% of its design capacity. Under this condition, there is no minimum flow velocity requirement.
7. Retention basins where runoff is infiltrated shall be designed based on the 100-year/24-hour storm event (3.13 inches).
8. Detention basin capacity shall be based on the 10-year/48hour storm event (2.48 inches). Detention basins may only be used with approval from the City Engineer.
9. Basin freeboard shall be set at a minimum of one (1') foot below the top of the lowest drop inlet grate or lowest gutter flow line, whichever is lowest, except freeboard on temporary basins with design water depth of one (1') foot or less may be reduced to six (6") inches.
10. Basins shall have chain link fence with barbed wire, mow strip and privacy slats, except privacy slats may be eliminated as approved by the City Engineer in areas where screening is not required. The material and color of privacy slats shall be approved by the City Engineer and noted on the drawings. Gate shall have twelve (12') foot (total width) double swing gates.