




# City of La Quinta

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## **ENGINEERING BULLETIN #06-15**

TO: All Interested Parties

FROM:  Timothy R. Jonasson, Public Works Director/City Engineer

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ORIGINAL EFFECTIVE DATE: December 19, 2006

SUBJECT: Underground Retention Basin Design Requirements

This bulletin establishes underground retention basin design specifications. All underground retention basins installed within the City of La Quinta should follow these criteria.

### ***Underground Retention Basin Design Requirements - General***

- Underground retention chambers should fully dissipate storm water within a 72-hour period. In many cases, use of drywells will be necessary to achieve the 72-hour dissipation standard.
- Maxwell Plus drywell injection rates should be assumed to equal 0.1 cfs per drywell for the 72 hour retention basin percolation calculation. Injection rates for alternative drywell designs shall be estimated by a qualified soils engineer and submitted for City Engineer review and approval.
- Drywells must penetrate a minimum of 10 ft into suitable permeable strata.
- Drywells may not be installed beyond a depth that intersects a water table. The final depth of the drywell must be above the top of the water table. Drywell injection zones must be segregated from sand intervals which will receive percolation from open bottom or perforated pipe storm flows.
- Underground retention chambers or perforated pipe systems shall have a minimum height of 4 feet (to facilitate maintenance) and a maximum height of 12 feet (to limit percolation volumes and deep soil recompaction). Non-conforming dimensions shall be subject to specialized review and approval by

the City Engineer.

- Minimum setback distance shall be thirty (30) feet from any underground retention basin, drywell injector or perforated pipe chamber to any building foundation, wall, paved roadway or equivalent structure.
- Underground retention systems will be designed to address standing, stagnant water and vector control issues including West Nile virus. Use of Maxwell Plus drywell systems, or equal within the open bottom area of the retention system is required to ensure percolation of standing water. Engineering Bulletin 06-16, Hydrology and Hydraulic Report Criteria for Storm Drain Systems should be consulted for determination of percolation rates for open bottom areas and drywells.
- All storm drain lateral connection points to underground retention vaults shall have standard manhole openings to assist in routine maintenance. Underground retention systems shall have sufficient manhole cleanouts and vents for functionality and servicing.
- Underground retention systems shall be periodically inspected by the owner or maintenance association of record. The inspection reports shall be submitted to the Public Works Department. Owner or maintenance association of record shall maintain underground retention systems under an ongoing service contract with a minimum of one confined space inspection/cleanout event per year per vault. A copy of the proposed or current maintenance contract will be submitted to the City's Public Works Department for review. Long term maintenance of perforated and open bottom underground retention systems is a key City concern. Deed restriction, maintenance covenant in the project CC&R's or other recorded instrument shall be utilized to provide for long term maintenance of these systems.

#### ***Underground Retention Basin Design Requirements - Open Bottom Systems***

- Reinforced concrete, High Density Polyethylene (HDPE) or approved equal vault style systems shall be specified. Other vault systems will be considered on a case by case basis. Site specific designs will include analysis of corrosive soil conditions, as applicable. Mitigation measures for corrosive soil conditions will be subject to approval by the City Engineer. A minimum design life-span of 100 years shall be assumed.
- A pre-filtration system for all drain lines connected to the underground retention shall be specified to collect sediment prior to discharge into the underground system. Areas prone to vegetation debris will be reviewed carefully to ensure that the design avoids vegetation decay, odor and possible gas formation. Use of Maxwell Plus drywell systems or equal adjacent to each drain line connection within the underground retention vault

may be considered to be an equivalent pre-filtration method, dependent on the application.

### ***Underground Retention Basin Design Requirements - Perforated Pipe Systems***

The City prefers open bottom above (or below) ground retention systems. Field observation has shown that long-term sedimentation and silting of the perforated pipe percolation media within the perforated pipe style systems is problematic. As an alternative, perforated pipe underground retention will be considered if multiple dry well injection points are included to dewater the perforated pipe system.

Since the perforated pipe systems (with drywell injector dewatering) require additional study and effort to implement and approve, the concept should be approached as an "at risk" design. A functional means of adequate desiltation has been an issue with perforated pipe systems. Should the designer still desire to use the perforated pipe system, the City offers the following general design guidance and specifications for these systems:

- Specialized report by a qualified geotechnical engineer should be prepared to confirm the viability of the concept for the specific site application.
- Conformance to NDPES regulations and City indemnification for storm water handling, sampling and environmental costs should be provided.
- Multiple drywells should be spaced a minimum of 200 feet apart from well head to well head.
- Installation of drywells will not be allowed where hazardous or toxic materials are used, handled, stored, loaded or treated, or where a spill of such materials could drain into the drywell system.
- Two chambered drywell systems equivalent to the Maxwell Plus System will be required for each drywell injector location as well as the primary sump drywell contained in the lowest profile elevation of the perforated pipe system.
- Mid perforation injection pressure required is assumed to be 40 psi based on measurement from the invert elevation of the sump outflow at the underground retention basin.
- Catch basins draining to perforated pipe retention system shall have a pretreatment device incorporating a basket containing a sediment/silt/trash catcher and hydrocarbon absorbent material.