



Chandler · Arizona
Where Values Make The Difference

Civil Engineering Underground Retention Review Checklist

Log No: _____

Project:	
Location:	

Item Number	Review Marks
/	Requirement satisfied.
O	Requirement not satisfied.
?	Unable to determine status, more information is required.
X	Not applicable.

Review #	Reviewed By	Date
1		
2		
3		
4		
5		

NOTE: The underground storage of storm water may be allowed in commercial or industrial sites. Underground storage is not allowed in apartment, condominium, townhome, or other residential developments. The requirements outlined below are from Chapter 6.10 of the City of Chandler *Technical Design Manual 3 - Drainage Policies and Standards*.

Item	Requirement	Comments
1.	<p>The installation of corrugated metal pipe for underground retention storage tank systems shall be in accordance with MAG Section 621. Excavation, bedding, and backfill shall be in accordance with MAG Section 601, material per MAG Section 760, and C-509.</p> <p>For other systems, show a manufacturer-approved backfill detail on the plans. The detail shall include the material and compaction requirements and must address backfill and compaction under the pipe haunches, to the springline of the pipe.</p>	

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Form No: UDM-006/Civil
6-3-11

Item	Requirement	Comments
	Provide a foundation footing detail for polypropylene chambers.	
2.	<p>Provide a soils report showing information at each proposed location of the underground storage system. The report must include:</p> <p>A. Soil boring results to a depth of at least 10 feet below the bottom of the proposed storage system, at each location, showing the depth of the proposed installation and noting the depth to groundwater.</p> <p>B. If a permeable backfill system is proposed, a double-wall infiltration test shall be performed at the foundation level of the system. The soils engineer shall additionally evaluate whether the soils are suitable as a foundation in the saturated condition.</p> <p>C. For corrugated metal tanks, include in the report the following data:</p> <ol style="list-style-type: none"> 1) Soil pH 2) Resistivity in ohm-cm. 	
3.	<p>Submit documentation demonstrating that the design life of the underground retention system will be greater than 75 years.</p> <p>The methodology for determining the soil side service life of the corrugated steel pipe must conform to the <i>Soil Side Durability of Corrugated Steel Pipe, Final Report 1991</i>, prepared for the National Corrugated Steel Pipe Association, or, the Estimated Average Service Life Charts in Appendix B of the City of Chandler <i>Technical Design Manual 3 - Storm Drainage System Design</i>.</p> <p>Show details for the lining and coating of the corrugated metal pipe storage tank(s) on the plans.</p>	
4.	<p>Submit calculations showing traffic and load bearing capacity of the underground retention system.</p> <p>A. Show the pipe gauge and corrugation size for CMP on the plans.</p> <p>B. Show the D-Load for RCP on the plans.</p> <p>C. Meet the manufacturer's minimum cover requirements for HDPE pipe. These minimum cover requirements may have to be</p>	

Item	Requirement	Comments
	exceeded in order to install the required access manholes.	
5.	<p data-bbox="258 222 894 285">Provide a minimum of two access points for each underground retention storage tank.</p> <p data-bbox="258 306 894 569">A. The access shall consist of 48-inch manhole shafts with 30-inch manhole frames and covers at grade, per C-400, except that the covers shall show "RETENTION TANK" instead of "SANITARY SEWER". Grated covers to allow for the inlet of surface storm water run-off may also be used in lieu of the solid covers.</p> <p data-bbox="258 590 894 747">B. The access must include a fixed ladder, anchored to the end wall of the storage tank. A structural engineer or the manufacturer must certify the structural integrity of the ladder installation.</p> <p data-bbox="258 768 894 869">C. Provide concrete collars, per C-401, for all manholes located in pavement areas or subject to wheel loads.</p>	
6.	<p data-bbox="258 905 894 1104">Show a manufacturer-approved backfill detail on the plans, or call out C-509 for corrugated metal pipe. The detail shall include the material and compaction requirements and must address backfill and compaction under the pipe haunches, to the springline of the pipe.</p>	
7.	<p data-bbox="258 1140 894 1339">Include a note on the plans specifying that all joints in the underground retention storage tank system will be water-tight, manufactured joints unless the foundation has been approved for saturated foundation condition, and an infiltration test has been performed.</p>	
8.	<p data-bbox="258 1375 894 1575">Provide a minimum of 3 feet of cover, to the bottom of the base of the pavement structure, over the underground retention storage tank system located in traffic areas. Provide a minimum of 3 feet of cover over the storage tank in non-pavement areas.</p>	
9.	<p data-bbox="258 1610 894 1799">Provide a detail on the plans showing the connection of the storage tank drain pipe into the interceptor chamber of the dry well. The invert of the drain pipe must be at or above the elevation of the inlet to the 4-inch cross-over pipe to the dry well chamber.</p>	

Item	Requirement	Comments
10.	<p>The drain pipe from the storage tank to the drywell interceptor chamber cannot be used to convey water from a retention basin into the underground storage tanks. Any water conveyed from a retention basin, road or parking surface is to be conveyed via storm drain pipe tied independently in to the underground storage tank. Surface run-off water can also be directly discharged in to underground storage tanks when grated lids are substituted for the solid covers at any of the manhole access points, noted in 5.A above.</p>	