# TITLE 18. ENVIRONMENTAL QUALITY
# CHAPTER 9. DEPARTMENT OF ENVIRONMENTAL QUALITY
# ARTICLE 3. AQUIFER PROTECTION PERMITS
# PART E. TYPE 4 GENERAL PERMITS

**R18-9-E301. 4.01 General Permit: Sewage Collection Systems**

D. Design requirements.

3. Manholes.

a. An applicant shall install manholes at all grade changes, size changes, alignment changes, sewer intersections, and at any location necessary to comply with the following spacing requirements:

| Sewer Pipe Diameter (inches) | Maximum Manhole Spacing (feet) |
|---|---|
| Less than 8 | 400 |
| 8 to less than 18 | 500 |
| 18 to less than 36 | 600 |
| 36 to less than 60 | 800 |
| 60 or greater | 1300 |

b. The Department shall allow greater manhole spacing if the applicant follows the procedure provided in R18-9-A312(G) and provides documentation showing the operator possesses or has available specialized sewer cleaning equipment suitable for the increased spacing.

c. The applicant shall ensure that manhole design is consistent with "Pre-cast Concrete Sewer Manhole" #420-1, revised January 1, 2004 and #420-2, revised January 1, 2001, "Offset Manhole for 8" – 30" Pipe" #421 (1998), and "Sewer Manhole and Cover Frame Adjustment" #422, revised January 1, 2001, published by the Maricopa Association of Governments; and "Manholes and Appurtenant Items" (WWM 201 through WWM 211, except WWM 204, 205, and 206), revised July 2002, published by Pima County Wastewater Management. This material is part of the material incorporated by reference in subsection (D)(1)(b).

d. The applicant shall not locate manholes in areas subject to more than incidental runoff from rain falling in the immediate vicinity unless the manhole cover assembly is designed to restrict or eliminate stormwater inflow.

e. The applicant shall test each manhole using one of the following test protocols:

i. Watertightness testing by filling the manhole with water. The applicant shall ensure that the drop in water level following presoaking does not exceed 0.0034 of total manhole volume per hour;

ii. Negative air pressure testing using the "Standard Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test, C1244-02e1 (2002)," published by the American Society for Testing and Materials. This material is incorporated by reference, does not include any later amendments or editions of the incorporated material and may be viewed at the Arizona Department of Environmental Quality, 1110 W. Washington, Phoenix, AZ 85007, or obtained from the American Society for Testing and Materials International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; or

iii. Holiday testing of a lined manhole constructed with uncoated rebar using the "High-Voltage Electrical Inspection of Pipeline Coatings, RP0274-2004 (2004)," published by the National Association of Corrosion Engineers (NACE International). This material is incorporated by reference as modified below, does not include any later amendments or editions of the incorporated material and may be viewed at the Arizona Department of Environmental Quality, 1110 W. Washington, Phoenix, AZ 85007 or obtained from NACE

International, 1440 South Creek Drive, Houston, Texas 77084-4906. The following substitutions apply:

(1) Where the word “metal” is used in the standard, use the word “surface” instead; and

(2) Where the words “pipe” or “pipeline” are used, use the word “manhole” instead.

f. The applicant shall perform manhole testing under subsection (D)(3)(e) after installation of the manhole cone or top riser to verify watertightness integrity of the manhole from the top of the cone or riser down.

i. Upon satisfactory test results, the applicant shall install the manhole ring and any spacers, complete the joints, and seal the manhole to a watertight condition.

ii. If the applicant can install the manhole cone or top riser, spacers, and ring to final grade without disturbance or adjustment by later construction, the applicant may perform the testing from the top of the manhole ring on down.

g. The applicant shall locate a manhole to provide adequate visibility and vehicular maintenance accessibility following construction.