**Section 604.250 Aquifer Types and Construction Methods**

a) Sand or Gravel Wells

1) Unless otherwise approved by the Agency under Section 604.145(b), the permanent casing and grout must extend at least 25 feet below the original ground elevation.

2) If a temporary or a surface casing is used, it must be completely withdrawn.

b) Gravel Pack Material

1) Gravel pack materials must:

A) be sized based on sieve analysis of the formation; and

B) be well-rounded particles of 95 percent siliceous material that are smooth and uniform, free of foreign material, properly sized, and washed and then disinfected immediately prior to or during placement.

2) Gravel Pack

A) Gravel pack must be placed in one continuous operation.

B) Gravel pack must be placed in a manner that prevents segregation and gradation during placement.

C) The annular space between the well screen and the hole must allow for proper placement of gravel pack.

D) Gravel pack must extend above the highest well screen with an allowance for settling.

E) Protection from leakage of grout into the gravel pack or screen must be provided.

F) Permanent inner casing and outer casings must meet the requirements of Section 604.240(d).

3) Unless otherwise approved by the Agency under Section 604.145(b), minimum permanent casing and grouted depth must be at least 25 feet below the original ground elevation.

c) Radial Water Collector

1) Locations of all caisson construction joints and porthole assemblies must be indicated on plans submitted to the Agency.

2) Provisions must be made to assure that radial collectors are essentially horizontal.

3) Caisson Construction

A) The caisson wall must be reinforced to withstand the forces to which it will be subjected.

B) The top of the caisson must be extended at least above the flood plain of a 100-year flood or flood of record and covered with a watertight floor.

C) All openings in the floor must be curbed and protected from entrance of foreign material.

D) The pump discharge piping must not be placed through the caisson walls.

d) Fractured or Highly Permeable Bedrock Aquifer Wells

1) Where the depth of unconsolidated formations is more than 50 feet over fractured or highly permeable bedrock, the permanent casing must be firmly seated in rock.

2) Where the depth of unconsolidated formations is less than 50 feet, the depth of casing and grout must be at least 50 feet.