

## NEBRASKA AMENDMENT

**686.22 ORIFICE PLATES**

Flow through orifice plates in furrows can be measured in two ways: sub-merged flow and free flow. The more accurate method is the submerged flow measurement.

Furrow slopes of less than 0.5% will generally allow orifice flow measurement by submerged flow. Slopes greater than 0.5% may not lend themselves to submerged flow measurements and require measurement by the free flow method.

The following precautions should be observed in installing plates and making submerged flow measurements. Table 686-5 gives the discharge for various orifice diameters and effective heads.

1. Install plates as nearly perpendicular to the direction of flow as can be done by "eye."
2. Install plates so the orifice opening will be at least one inch from the furrow boundary (bottom and sides). If the furrow silts up near the bottom of the opening during operation, clean it out and wait for the flow to restabilize before making a measurement.

3. Install plates so the downstream water surface will be above the top of the opening for submerged flow conditions.
4. Use extreme care in making head measurements. The effective head is the difference in elevation between the water surfaces above and below the orifice.
5. Be sure head has reached maximum before making measurements. A match or twig can be placed at the water edge upstream from the orifice; and by observing water line at this point, it can readily be determined when flow has stabilized.
6. Store and handle orifice plates so as to protect the edges of the orifice openings. Measurement errors will be introduced if the edges of the openings become battered or rounded.

The same installation precautions should be used with free flow with the following exception.

1. The plates should be installed so there is no backwater interference on the orifice flow from downstream influences.
2. The head should be read from the middle of the orifice to the upstream water elevation.

Table 686-6 shows the flow rates for free flow.