

# Terrace Inlets:

## Why is an orifice so important?

### *What is the Purpose of an Orifice?*

Nebraska NRCS designs storage terraces to drain a single storm event through an underground outlet in a set amount of time - anywhere from 6 hours to 24 hours, depending on producer and designer preference. That “drain-down” time is controlled by an orifice.

What many people don’t realize is that every other part of a tile outlet system is dependent on that orifice.

The orifice is basically a hole, in a plate or fitting, at the base of the riser, near the connection with the offset pipe or main outlet line. Its purpose is to make sure the outlet “system” works as designed; that it’s a balanced system.

That little orifice plate also helps keep a tile system economical by keeping flows smaller so downstream pipes don’t get bigger.

### *A Balanced System*

#### System Capacity

All system components (riser, riser holes, orifice, offset, main pipe) are designed to assure the terraces are “drained” before crops are damaged by flooding.

Even though the orifice plate is smaller than the pipe below, it is able to push adequate flow through because of water head pressure in the riser and terrace above it.



#### System Control & Water Quality

All system components “control” velocities while also maintaining capacity. Lower flow velocities at the riser:

1. Settle sediment at the channel, which keeps soil on the farm and improves water quality downstream.
2. Reduces the amount of debris that enters the riser holes.
  - a. Faster flow at the holes tends to drive more debris in, which can lead to plugging.
  - b. Slower flow at the holes allows the debris to float away instead of being pushed or pulled in.



### *What Happens if the Orifice is Removed?*

When an orifice plugs, it’s very tempting to remove it altogether and never put it back. But doing so throws all hydraulic performance assumptions out the window, and can cause some serious issues:

The pipe that was once big enough now becomes too small to handle all the flow entering it, which creates pressure flow in the tile system. Pressure flow can cause water to back up into and “overtop” terraces. It can create hydraulic forces in the main line called “piping” that can suck soil through the pipe fittings. NRCS designs in Nebraska don’t allow pressure flow between risers.

If the riser and orifice aren’t working together and debris is being forced into the riser, sediment and pollutants likely are, too. Those pollutants are getting “flushed” into streams.