SLOPE vs % GRADE

One of the most costly errors encountered by Utility Contractors is burying a run of pipe at the incorrect grade. Often, operator error in setting the proper grade into the pipe laser is the cause. Utility plans instruct the contractor at what "slant" the pipe is to be run. The slant of the laser beam in a pipe laser can be accurately adjusted to follow the design specifications of the project. Most plans give the slant of the pipe as SLOPE, which is determined by dividing the elevation difference by the distance between beginning and end point (often manholes). In the utility plan below, Manhole 1 has an outgoing pipe elevation of 60.15'. Manhole 2 has the incoming pipe elevation of 59.45'. The elevation difference is (60.15 – 59.45) is 0.70'. The distance between the two manholes is shown on the plan as 139'. In this example the SLOPE is calculated by dividing 0.70' by 139' (0.70/139 = .0050) and is shown on the plan as **S=0.005**. Most *PIPE LASERS* express their readings as PERCENT GRADE, which indicates the elevation difference in 100'. The SLOPE number must be multiplied by 100 to get **% grade**. Therefore, (S=0.005 x 100)= 0.50**% grade** and the *PIPE LASER*'s grade counter would be set at 0.50. Using a common sense check, an operator should realize a .5**% grade** means a difference of ½' in 100' run. So a difference of 0.7' in a run of 139' is logical. If pipe is laid from Manhole 1 to Manhole 2, a **% grade** of -0.50% would be set into the pipe laser because the pipe is dropping elevation.