

QUARTERLY PROGRESS REPORT

1 January 2009 to 31 March 2009

No additional funding was received for the project in this reporting period. So the total funding received for the TPF-5(164) study is \$180,000. In this reporting period we continued working on capturing boundary layer velocities using the 3-dimensional (stereo) Particle Image Velocimetry (PIV) system. The 3-dimensional velocity flow field was recorded in several cross-sections of the culvert. This was done for 9 different flow velocities and 3 different flow depths. The data can be visualized as vector plot or as color contour plot. The low flow zones are very clearly visible in the color contour plots (Figure1 to Figure 4). The velocity flow field recordings were performed on a culvert section with helical corrugations (pipe diameter 36" with 2.66"x0.5" corrugations). In next step we will install a section of the 30" diameter pipe with 3"x1" annular corrugations received from CONTECH and perform the boundary layer flow field investigation. In the period from 01-01-09 to 03-31-09 no funds were received and \$9,418.95 was spent.

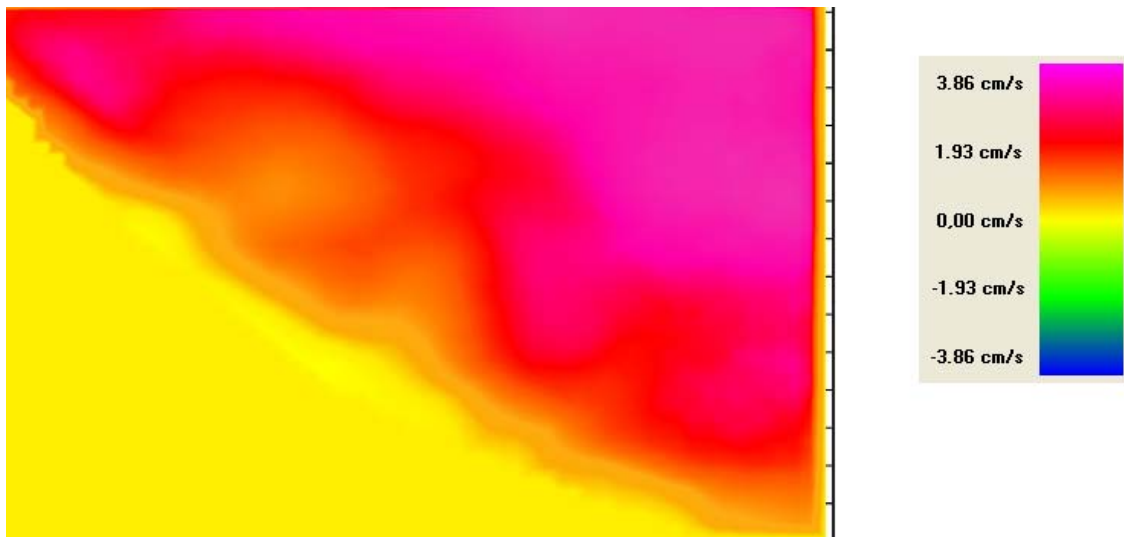


Figure 1: Average Velocity 3.6 cm/s and flow depth 14.0 cm

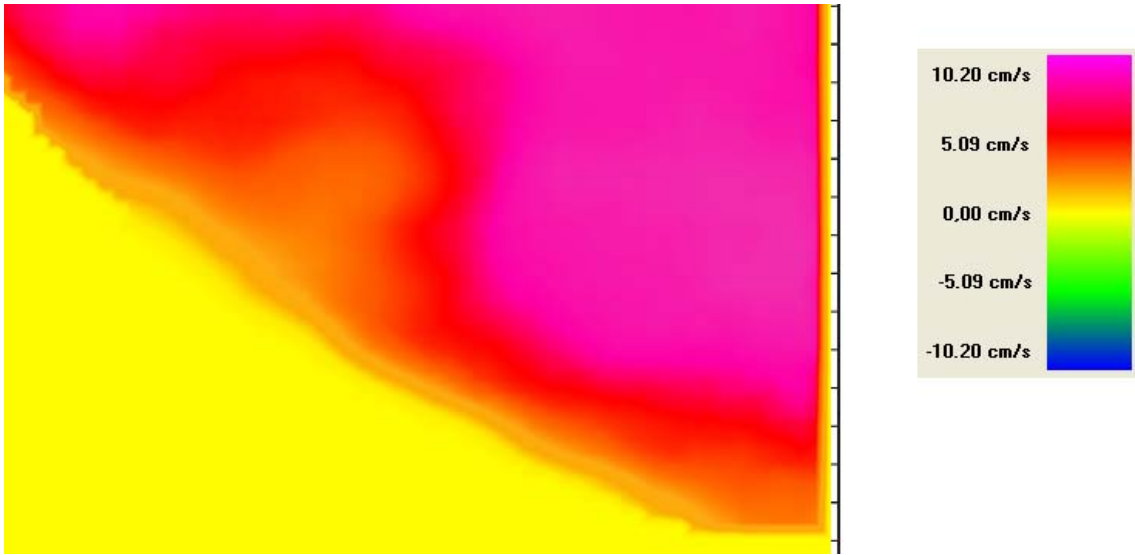


Figure 2: Average Velocity 9.0 cm/s and flow depth 14.0 cm

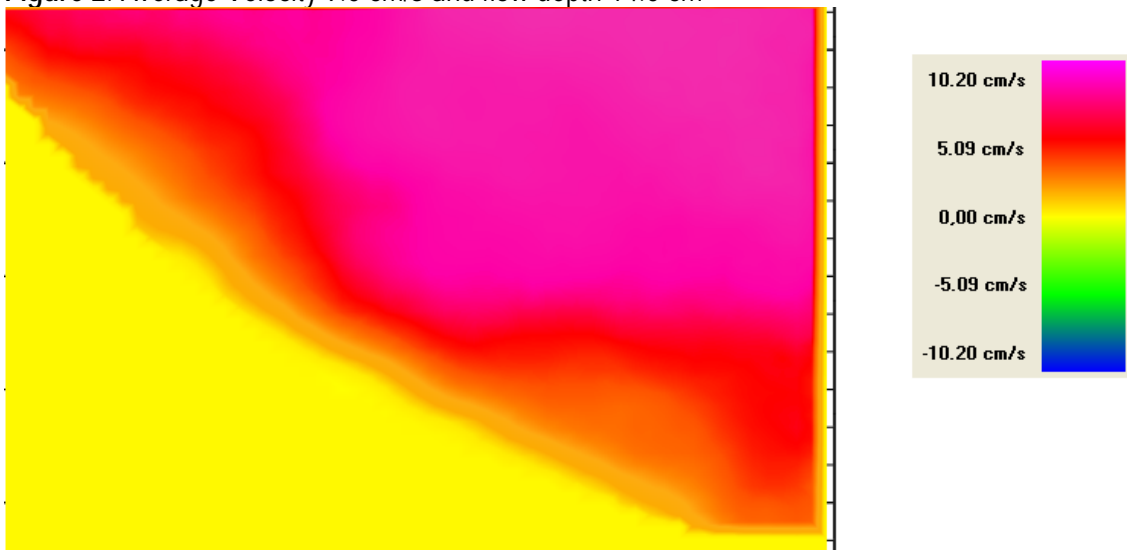


Figure 3: Average Velocity 10.0 cm/s and flow depth 14.0 cm

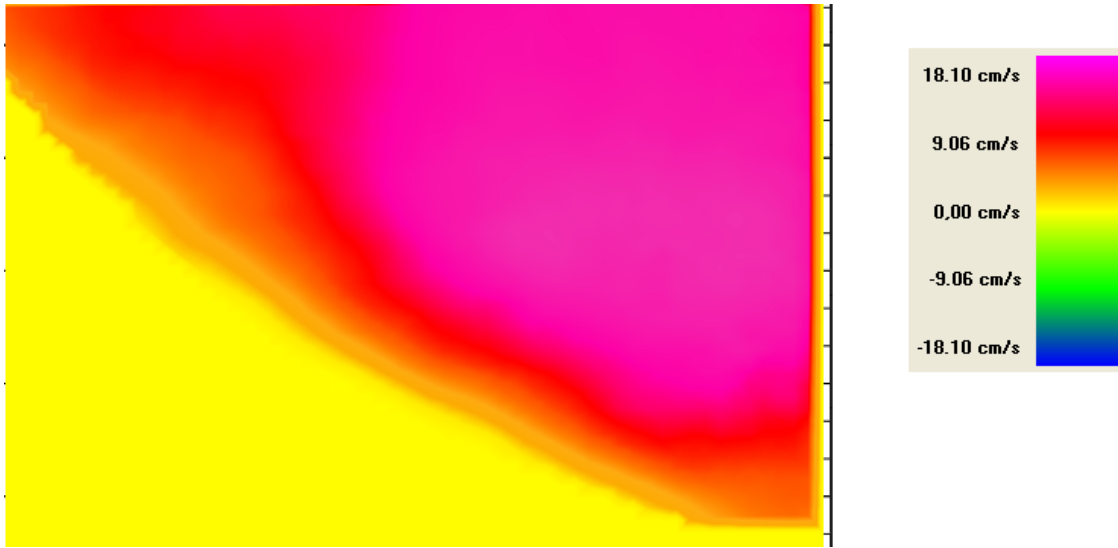


Figure 4: Average Velocity 17.0 cm/s and flow depth 14.0 cm