A major sanitary sewer collection system was constructed in Salt Lake City in mid-1989 using Large Diameter Polyethylene Profile Wall Sewer Pipe (ASTM F 894) for the installation.

The contract specifications required deflection testing to be conducted "within five days after installation and shall not exceed three percent. A second deflection test shall be conducted 11 months after the completion of the project and shall not exceed five percent".

In July 1992, two years after installation, eight locations were selected for evaluation as being representative of the entire project. Deflection measurements were conducted on approximately 2,800 LF of 30-inch to 42-inch PE Class 100 pipe. The Pipe Stiffness ranged from 31 psi to 12 psi, which was less than the Industry's generally established minimum stiffness of 46 psi.

A deflection survey was performed on four different pipe diameters, the results of which showed approximately 152 occurrences where the deflection exceeded 5 percent (5%). Over 1,070 feet of the 2,800 feet investigated exceeded the specified allowable 5 percent deflection with the maximum deflection measured at 16.6 percent. This amounted to 40 percent of the footage surveyed.

**SUGGESTED RECOMMENDATIONS:**

- Time dependent factors should be evaluated in design for long-term (50 years) material properties.
- Plastic pipe deformation increases with time.
- Only pipes with Pipe Stiffness of 46 psi or greater should be used.
- Flexible pipe installations demand greater efforts in compaction of backfill materials.
- Only high quality granular backfill material should be used.
- Mandatory deflection testing at 30 days and again at 11 months after installation.
- No rerounding efforts on installed pipe allowed.
- Trench width of 5 pipe diameters when trench boxes are used or unstable soil conditions are encountered.

-- DEFLECTOMETER READINGS --

**NOTE**
Each chart represents a different distance, however the station limits are shown on each chart. Due to space constraints, only three charts out of eight total are shown.