

## Northwest Tollway Drainage Improvements, Mile Post 0.0 to Mile Post 8.7

*Cured-in-place  
sewer lining  
accommodated  
bends*

RJN Group, Inc. was selected to perform an engineering study and develop construction documents for drainage infrastructure improvements along the Northwest Tollway. The problems with the drainage system included:

- 40-year old culverts were not well maintained due to access difficulties of maintenance vehicles
- The roadway is on a steep embankment making it difficult to maintain ditch integrity
- The steep slopes tend to erode, causing further drainage and embankment stability problems

Some culverts had poor alignment or slope requiring lining or replacement.

Each culvert was inspected from the end sections and at connected median structures in an effort to evaluate their condition. Culverts typically were structurally unsound or had maintenance problems.

Confined space entry procedures were followed when entering median inlets to obtain rim to invert distances and pipe conditions at inlet structures.

Unique aspects of the field study and design development included:

- The use of cured-in-place sewer lining to accommodate bends in high slope areas
- The use of slip-lining for straight sewers
- Manhole rehabilitation using epoxy materials
- Daily traffic control to avoid permanent lane closures

