



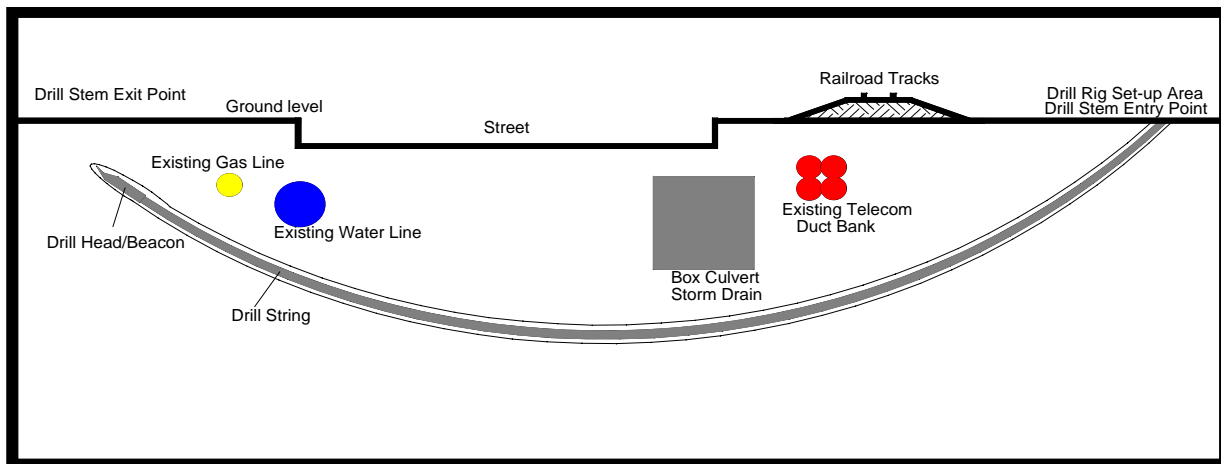
**Horizontal Directional Drilling Specialists**

## Basic Horizontal Directional Drilling Project

A drill path is determined based on site-specific conditions. These conditions include work area limitations, surface obstructions, underground obstructions; drill string and product bend radius limitations, etc.

The following example illustrates the placement of product under a railroad tracks and a street with various existing utilities to be crossed along the drill path.

The pilot hole is drilling along a predetermined path using a jet bit or a downhole motor. A beacon located in the drill head sends position information to the surface for steering corrections.



After the pilot hole is drilled, a Back-Reamer/Hole Opener is fitted to the end of the drill string and pulled through the pilot hole. A swivel assembly fitted between the Back Reamer/Hole Opener and the final product prevents rotation and/or twisting of the final product. As the drill string is pulled back to the rig, the final product is placed in the bore hole.

