



# Table of Contents

## Chapter 9 - Utilities

### 9A General Information

|                              |   |
|------------------------------|---|
| 9A-1-----General Information | 1 |
| A. General.....              | 1 |
| B. Definitions.....          | 1 |
| C. Design.....               | 2 |

### 9B Trench Design

|  |   |
|--|---|
| 9B-1-----General Information for Trench Design | 1 |
| A. Trench Theory.....                          | 1 |
| B. Bedding and Foundation Materials.....       | 1 |
| C. Backfill Materials.....                     | 2 |
| D. Dewatering.....                             | 3 |
| 9B-2-----Rigid Pipes                           | 1 |
| A. Introduction.....                           | 1 |
| B. Trench Width.....                           | 1 |
| C. Pipe Strength.....                          | 2 |
| D. Bedding Factors.....                        | 3 |
| E. Live Load.....                              | 3 |
| 9B-3-----Flexible Plastic Pipes                | 1 |
| A. Introduction.....                           | 1 |
| B. Soil-pipe Interaction.....                  | 1 |
| C. Pipe Design.....                            | 2 |
| D. Flexible Pipe Bedding.....                  | 4 |
| E. Trench Width.....                           | 5 |
| F. Pressure Pipe.....                          | 5 |
| 9B-4-----Ductile Iron Pipe                     | 1 |
| A. Introduction.....                           | 1 |
| B. Pipe Design.....                            | 1 |
| C. Bedding.....                                | 1 |
| 9B-5-----Depth of Bury Tables                  | 1 |
| A. General.....                                | 1 |
| B. Rigid Pipe Assumptions.....                 | 1 |
| C. Flexible Pipe Assumptions.....              | 4 |
| D. Ductile Iron Pipe Assumptions.....          | 6 |

**9C Casing Pipe**

9C-1-----Casing Pipe

- A. General..... 1
- B. Casing Thickness..... 1
- C. Casing Diameter..... 2

**9D Utility Cut Restoration**

9D-1-----Utility Cut Restoration

- A. General..... 1
- B. Background..... 1
- C. Factors Affecting Patch Performance..... 2
- D. Recommended Utility Trench..... 8

**9E References**

9E-1-----References