

# TABLE OF CONTENTS

(Summary)

Page

## PREAMBLE

Introduction.....	i
Revisions.....	ii

## 1.0 GENERAL UTILITY OBJECTIVES

1.1 General Goals and Principles.....	1-1
1.2 Use of Local Resources.....	1-1
1.3 Life Cycle Costs.....	1-2
1.4 Energy Management.....	1-2
1.5 Appropriate Technology.....	1-3
1.6 Codes, Regulations and Guidelines.....	1-4
1.7 GNWT Standard Drawings.....	1-6
1.8 Roles and Responsibilities.....	1-7
1.9 Contacts.....	1-8

## 2.0 PIPING

2.1 Introduction.....	2-1
2.2 Materials in Use.....	2-1
2.3 Above or Below Grade Installation.....	2-3
2.4 Pipe Material Selection Criteria.....	2-5
2.5 Utilidors.....	2-10
2.6 Pipe Bedding.....	2-11
2.7 Connections to Structures.....	2-13
2.8 Freeze Protection.....	2-15
2.9 Thaw Recovery.....	2-16
2.10 Pipe Testing.....	2-18

## 3.0 ACCESS VAULTS AND MANHOLES

3.1 Introduction.....	3-1
3.2 Materials in Use.....	3-1
3.3 Manhole and Access Vault Selection Criteria.....	3-2
3.4 Structural Design.....	3-7
3.5 Access Vault/Manhole Location.....	3-7
3.6 Access Vault Bedding.....	3-8
3.7 Prevention of Frost-Jacking.....	3-8
3.8 Prevention of Floatation.....	3-9
3.9 Prevention of Groundwater Infiltration.....	3-9
3.10 Mechanical Components.....	3-10
3.11 Marker Posts.....	3-12
3.12 Testing.....	3-13

## **4.0 FIRE PROTECTION**

4.1	Introduction.....	4-1
4.2	Fire Hydrant Types in Use.....	4-1
4.3	Flow Requirements.....	4-2
4.4	Distribution.....	4-3
4.5	Freeze Protection.....	4-3
4.6	Isolation.....	4-4
4.7	Outlets.....	4-6
4.8	Consistency.....	4-7
4.9	Water Storage for Fire Protection.....	4-7
4.10	Piped System Fire Pumps.....	4-7

## **5.0 WATER SERVICES**

5.1	Introduction.....	5-1
5.2	Materials in Use.....	5-1
5.3	Design Criteria.....	5-1
5.4	Freeze Protection.....	5-2
5.5	Thaw Recovery.....	5-5
5.6	Valving, Connection to Mains.....	5-6
5.7	Curb Stops.....	5-9
5.8	Building Connection.....	5-9
5.9	Installation and Replacement.....	5-11
5.10	Pipe Bundles – Utilidor.....	5-12

## **6.0 SANITARY SEWER SERVICES**

6.1	Introduction.....	6-1
6.2	Materials in Use.....	6-1
6.3	Design Criteria.....	6-1
6.4	Installation.....	6-2
6.5	Main Connection.....	6-2
6.6	Freeze Protection.....	6-4
6.7	Thaw Recovery.....	6-5
6.8	Building/Plumbing Connection.....	6-6
6.9	Pipe Bundles – Utilidor.....	6-6
6.10	Sewer Service Pumps.....	6-7

## **7.0 WATERMAINS**

7.1	Introduction.....	7-1
7.2	Materials in Use.....	7-1
7.3	Design Criteria.....	7-1
7.4	Valving.....	7-2
7.5	Thrust Blocking.....	7-3
7.6	Connection to Structures.....	7-3
7.7	Fire Hydrants.....	7-3
7.8	Insulation.....	7-3
7.9	Testing.....	7-3
7.10	Leak Detection.....	7-4
7.11	Watermain Replacement.....	7-4

## **8.0 SANITARY SEWERS**

8.1	Introduction .....	8-1
8.2	Materials in Use .....	8-1
8.3	Design Criteria .....	8-1
8.4	Testing .....	8-2
8.5	Connection to Structures .....	8-2
8.6	Insulation .....	8-2
8.7	Sewermain Replacement .....	8-3

## **9.0 TRUCKFILL STATIONS AND PUMP HOUSES**

9.1	Introduction .....	9-1
9.2	Flow Rate Requirements .....	9-1
9.3	Intake System .....	9-2
9.4	Self-Draining Capability .....	9-5
9.5	Truckfill Means .....	9-6
9.6	Building Envelope .....	9-8
9.7	Building Layout/Floorplan .....	9-9
9.8	Mechanical/Electrical Systems .....	9-9
9.9	Site Grading .....	9-10
9.10	Standby Power .....	9-11
9.11	Site-Generated Power .....	9-11
9.12	Security .....	9-12

## **10.0 HOUSEHOLD STORAGE TANKS**

10.1	Water Storage Tanks .....	10-1
10.2	Sewage Storage Tanks .....	10-1

## **11.0 WATER QUALITY AND TREATMENT**

11.1	Introduction .....	11-1
11.2	Codes, Regulations and Standards .....	11-1
11.3	Water Source Selection .....	11-1
11.4	Treatment Process Selection .....	11-3
11.5	Impacts of Storage on Water Quality .....	11-5
11.6	Disinfection System .....	11-6
11.7	Water Quality Monitoring .....	11-7
11.8	Safety .....	11-9
11.9	Residuals .....	11-10
11.10	Record Keeping and Reporting .....	11-10

## **12.0 WATER STORAGE**

12.1	Introduction .....	12-1
12.2	Design Criteria .....	12-1
12.3	Materials in Use .....	12-2
12.4	Seasonal Storage .....	12-3
12.5	Piped System Storage Capacity .....	12-4
12.6	Trucked System Storage Capacity .....	12-4

## 13.0 INSULATION

13.1	Introduction .....	13-1
13.2	Materials in Use .....	13-1
13.3	Selection Criteria.....	13-2
13.4	Waterproofing .....	13-2
13.5	Field-Applied Foam.....	13-4
13.6	Insulation Thickness .....	13-4
13.7	Ultraviolet and Mechanical Protection .....	13-5

## APPENDICES

A	Typical GNWT Water and Sewer Drawings.....	A-1
B	Distribution of Draft <i>Good Engineering Practice</i> Guidebook.....	B-1

## INDEX