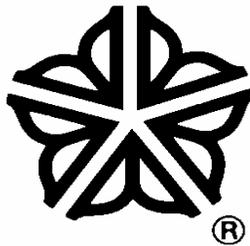


**DESIGN AND CONSTRUCTION
GUIDELINES
FOR
PROJECTS ADJACENT TO THE
CITY OF ROCHESTER'S
WATER SUPPLY CONDUITS**



Prepared by:

**CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES
BUREAU OF WATER**

**June 10, 1999
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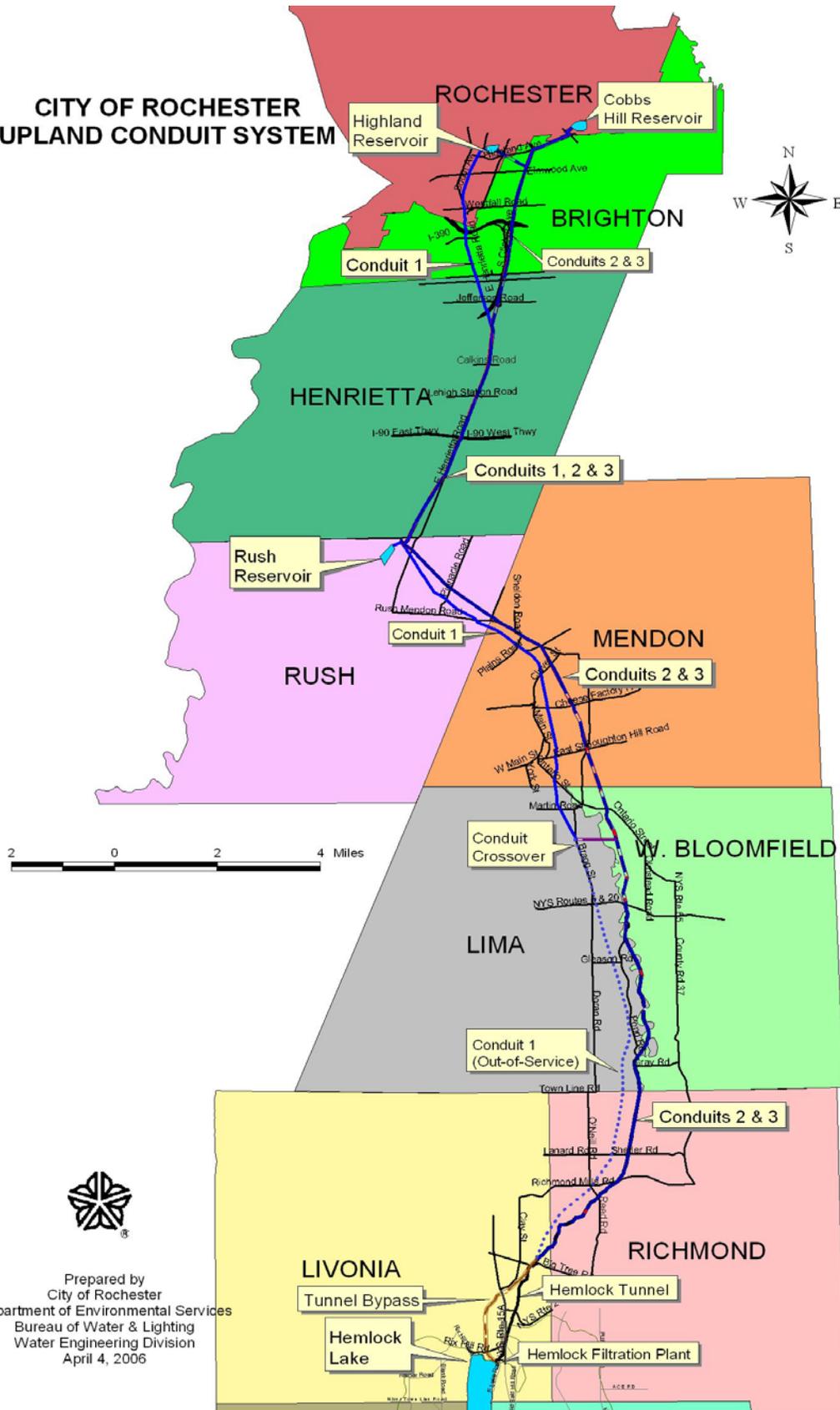
1.0 INTRODUCTION

This document was prepared to assist property owners, developers, contractors, engineers, utility agencies, municipalities and transportation officials when planning, designing and constructing projects that are adjacent to the City's water supply conduits. Projects can range in size from small home improvement projects such as landscaping and fence, pool or deck installations to the development of large multiple lot subdivisions and major road reconstruction projects.

The City of Rochester maintains three conduits that are used to transmit treated water from the City's Hemlock Lake Water Filtration Plant to the City of Rochester, a distance of approximately 28 miles. The conduits range in size from 24 inch diameter to 38 inch diameter and are constructed of several types of materials, including: wrought iron, cast iron, ductile iron, riveted steel, lockbar steel, spiral welded steel and high density polyethylene. The first conduit (Conduit I) was installed between 1874 and 1875. The conduits pass through the Towns of Livonia, Richmond, Lima, West Bloomfield, Mendon, Rush, Henrietta, Brighton; the Village of Honeoye Falls and the City of Rochester. A Map of the City's Conduit System is found on page 2. The conduits are buried underground and generally have a depth of cover ranging between 4 feet and 7 feet below the ground surface. In some areas the depth of cover may be deeper or shallower. Some appurtenant structures, such as valve and meter vaults, valve boxes, drain pipes and hydrants are located at or above the ground surface. A significant portion of the conduit system south of Rush Reservoir is protected from corrosion by a cathodic protection system. This cathodic protection system includes underground wires that run parallel to the conduit and are generally located within 10 feet of the conduit. The Livingston County Water and Sewer Authority, the Monroe County Water Authority and several municipalities have connections to the City's conduits that are used to supply water to their customers.

The conduits and their appurtenances are located within permanent easements and right-of-ways on privately owned property (or in some cases, within public road right-of-ways or City-owned property) acquired by the City prior to the installation of the conduits. Easement and right-of-way widths vary, but generally range between 30 feet and 66 feet through privately owned properties. In some areas easement widths may be wider or narrower. The easements and right-of-ways provide the City with the right to access the conduits and permit the City to construct, reconstruct, repair, operate, replace and otherwise maintain the conduits and their appurtenances. When the conduits were originally constructed, the land that the conduits passed through was predominantly rural. However, in the last few decades there has been a steady growth in development of this land, particularly in the Towns of Mendon, Rush and Henrietta, as well as the Village of Honeoye Falls. It is anticipated that this development trend will continue and expand south into Livingston County.

**CITY OF ROCHESTER
UPLAND CONDUIT SYSTEM**



Prepared by
City of Rochester
Department of Environmental Services
Bureau of Water & Lighting
Water Engineering Division
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2.0 GUIDELINES

2.1 GENERAL

The following guidelines are to be used in conjunction with other federal, state and local codes, standards, guidelines and specifications. These guidelines have been developed with the primary objective of protecting the City's water transmission conduits from damage when construction-related activities occur adjacent to the conduits. The guidelines were also established to insure that the conduits are readily accessible for maintenance, operation and emergency repairs while minimizing service disruption to water customers and disturbance to land owners.

2.2 PLANNING AND DESIGN

When planning and designing a project, it is important to identify existing features that may either be impacted by the construction or that may otherwise limit how proposed facilities will be constructed and where they will be located.

The City strongly encourages landowners, developers and facility planners to contact the City early in the planning and design process to verify whether or not a project is located along the route of its conduits. The City's Bureau of Water - Upland Supply and Maintenance Division - Hemlock Operation Center (Phone: 585-428-6681 / Fax: 585-367-9422) is available to answer questions, meet with owners, developers or planners on site and provide field stakeout of the conduits to facilitate project design and construction. In some areas, information is available on the burial depth of the conduits. When information on burial depth is not known and may be critical to the project design (particularly when designing utility crossings, road crossings or for grading operations), the owner/developer or designer will be responsible for excavating one or more test pits to expose the top of the conduit(s). Hand digging will be required when excavating around the conduits. A representative of the Bureau must be on site when excavations occur over or adjacent to the conduits. When verifying the depth of cover over the conduits in locations where two or three conduits are parallel, a test pit should be excavated for each conduit because in most cases the conduits were installed at different depths. It is important that the test pit excavator notify Dig Safely New York (previously known as the Underground Facilities Protection Organization (UFPO) –Phone: 1-800-962-7962) at least two working days before excavating to obtain all utility stakeouts in the area. The excavator must be familiar with the requirements of 16 NYCRR Part 753 - Protection of Underground Facilities (formerly known as Industrial Code Rule 53).

Plans for all projects located within or immediately adjacent to the conduit easements and right-of-ways or that are otherwise immediately adjacent to the conduits or cross the conduits must be submitted to the Bureau for review and approval before construction begins. Plans shall be submitted to the attention of the Assistant Superintendent of Water Supply and Maintenance at the Bureau's Hemlock Operation Center, 7513 Rix Hill Road, Hemlock, NY 14466. The Assistant Superintendent may refer plans for major projects (single and multiple

Design and Construction Guidelines for Projects Adjacent to the City of Rochester's Water Supply Conduits

lot subdivision developments, utility distribution and transmission mains and street rehabilitation/reconstruction projects) to the Bureau's Managing Engineer for further review. The following notes are to be affixed to plans submitted for review of all projects:

1. Excavator must notify Dig Safely New York (previously known as the Underground Facilities Protection Organization) at 1-800-962-7962 at least two working days before excavating in order to obtain stakeouts for all utilities in the area.
2. A representative of the City's Bureau of Water - Upland Supply and Maintenance Division must be on-site when excavating in the vicinity of the City's water supply conduits and their appurtenances. Notify the Bureau's Hemlock Operation Center 585-428-6681 at least two working days before excavation commences.

Plans shall be prepared to scale and shall show existing and proposed structures, existing and proposed ground surface elevations (when grading is proposed), existing and proposed utilities and the location of the City's conduit(s) and easement or right-of-way.

The construction of permanent structures and the planting of trees and shrubs within the City's conduit easements and right-of-ways is prohibited. Access along the easements and right-of-ways must remain unimpeded to insure that the conduits are readily accessible by the City for inspection, repair, operation and maintenance.

The following design guidelines have been established for the various activities that normally occur as part of a construction project and could adversely impact the conduit system if not properly addressed during the planning and design process. These activities include: grading, utility installation, construction of buildings and miscellaneous structures, landscaping and transportation system improvements.

2.2.1 Grading

Grading involves disturbing the ground in a way that changes the surface elevation. This is accomplished either by removing soil or other materials from an area or depositing soil, fill or other material over an area.

When a project involves grading an area over the conduits such that the surface elevation will be lowered, it will be the responsibility of the project designer to insure that adequate soil cover will be maintained over the conduits to insure that they will be insulated from freezing and also protected from damage by vehicular traffic or construction equipment. In order to meet these criteria, a minimum cover of four and one half feet must be maintained over the top of the conduits. The Bureau will assist the designer by providing existing depth of cover information when it is

available. When this information is not available, the owner/developer or designer will be responsible for excavating one or more test pits over the top of the conduit(s) as previously described in Section 2.2

When a project involves grading an area over the conduits such that the surface elevation will be raised, it will be the responsibility of the project designer to insure that appurtenant structures, such as valve and meter vaults, valve boxes, drain pipes and hydrants will not be buried and will remain accessible to Bureau personnel. The use of vibratory equipment to compact fill material within 30 feet of the conduits is prohibited in order to minimize the potential for damage.

2.2.2 Utilities

Utilities include, but are not limited to, public and private services, distribution and transmission lines such as electric, gas, water, sewer, telephone and cable T.V., wells and septic systems. These utilities are normally installed by excavating (digging, augering, drilling, boring, plowing in, pulling in, trenching and tunneling) using mechanized equipment. Utilities installed above ground usually require excavation for installation of support poles.

When planning or designing a utility that will cross the conduits, the planner/designer will be responsible for excavating a test pit to expose the top of the conduit(s) when this information is critical to the design of the utility and no record information is available. Utility crossings should be designed so that they cross perpendicular to the conduit alignment. A minimum vertical separation of 18 inches must be provided above or below the conduit, measured between the outside wall of the conduit and the outside wall of the utility conduit, casing, duct or pipe. Septic systems and wells shall not be located within the City's easement or right-of-way. When a utility is to be installed on an alignment that is parallel to the conduit alignment, the following minimum horizontal separations shall be maintained.

	<u>Minimum Horizontal Separation</u>
Sanitary or Storm Sewers (including manholes) to Water Conduits and Appurtenances	10 Feet
All Other Utilities (including vaults) to Water Conduits and Appurtenances	5 Feet

2.2.3 Buildings and Miscellaneous Structures

Buildings and other miscellaneous structures shall not be located within the conduit easements and right-of-ways. Miscellaneous structures include, but are not limited to, pools, sheds, ponds and fences. If buildings and structures were situated within the easements they would interfere with the City's ability to access, maintain, operate and repair the conduits and their appurtenances. It is the responsibility of the owner/developer and his designer to accurately locate the limits of the conduit easements and insure that no buildings and structures will be constructed within the conduit easements or right-of-ways. A metes and bounds description of the easement or right-of-way can usually be found in the property owner's abstract of title. This information can also be found in the office of the County Clerk where the property is located. In some instances, descriptions and maps of the easement or right-of-way are available from the Water Bureau's Maps and Records Office, 10 Felix Street, Rochester, NY 14608 (Phone: 585-428-7562 / Fax: 585-428-7880).

When planning and designing buildings which will be located immediately adjacent to the conduit easement or right-of-way, several feet of clearance should be maintained between the easement/right-of-way line and the outermost limit of the building (usually the structural foundation wall or footing) in order to make allowances for inaccuracies in establishing the precise location of the easement and in staking out the proposed building.

2.2.4 Landscaping

Trees and shrubs shall not be located within the conduit easements and right-of-ways. If trees and shrubs were situated within the easements they would interfere with the City's ability to access, maintain, operate and repair the conduits and their appurtenances. It will be the responsibility of the owner/developer and his designer to accurately locate the limits of the conduit easements and insure that no trees and shrubs will be planted within the conduit easements or right-of-ways. A metes and bounds description of the easement or right-of-way can usually be found in the property owner's abstract of title. This information can also be found in the office of the County Clerk where the property is located. In some instances, descriptions and maps of the easement or right-of-way are available from the Water Bureau's Maps and Records Office, 10 Felix Street, Rochester, NY 14608 (Phone: 585-428-7562 / Fax: 585-428-7880).

2.2.5 Transportation System Improvements

Transportation system improvement projects can include sidewalk and driveway installations, pavement resurfacing and highway reconstruction. These projects can involve excavation and grading. Highway reconstruction projects often include utility construction. It will be the responsibility of the project designer to accurately locate the conduits during the planning process. When a transportation system improvement involves changing the surface elevation of the ground above the conduit(s), a minimum cover of four and one half feet must be maintained over the conduit(s). Additionally, it may be necessary to adjust valve boxes, hydrants and vault covers and other appurtenances to the new finished grade. The use of vibratory equipment to compact material within 30 feet of the conduits is prohibited in order to minimize the potential for damage.

2.3 CONSTRUCTION

A representative of the Water Bureau's Upland Supply and Maintenance Division must be on site when there is an excavation in the vicinity of the City's water supply conduits, including test pit excavations to verify the location of the conduit. The Division's Hemlock Operation Center (585-428-6681) must be contacted at least two working days before excavation commences.

Rules and procedures have been established in New York State for the protection of underground facilities in order to assure public safety and to prevent damage to public and private property. These rules and procedures are found in 16 NYCRR Part 753 - *Protection of Underground Facilities* which spell out the duties and responsibilities of the excavator. Excavators must be familiar with the requirements of these rules and regulations. In summary, the excavator is required to call Dig Safely New York (previously known as the Underground Facilities Protection Organization), 1-800-962-7962 at least two, but not more than, ten working days before excavating. The facility owner will stake out the location of the underground facility. When the work area overlaps the tolerance zone for the staked-out utility, the excavator must verify the precise location, type, size, direction of run and depth of the facility. For the conduits, it will be necessary for the excavator to expose (by hand digging) the top of the conduit. After verifying the location of an underground facility, the excavator cannot employ powered or mechanical equipment near the facility. The excavator must provide support and protection of the conduits. If over half the circumference of a lead joint on the City's cast iron water supply conduit is exposed, a bell joint leak clamp may need to be installed at the joint, as directed by the Bureau. The Bureau may install a cathodic protection anode or install an electrical joint bond on the conduit prior to backfilling. When backfilling around the conduits, sand shall be used to encase the pipe for approximately one foot surrounding the conduit. Backfill material shall be properly compacted. The use of vibratory compactors within 30 feet of the conduits shall be prohibited.