

Map, Plan, and Report

For The

City of Niagara Falls 72nd Street Water Improvements

September 2015



Clark Patterson Lee
DESIGN PROFESSIONALS

TABLE OF CONTENTS

I.	GENERAL.....	1
II.	PROJECT AREA.....	1
III.	EXISTING FACILITIES.....	2
IV.	NEED FOR PROJECT.....	2
V.	ALTERNATIVES CONSIDERED.....	3
VI.	CONCLUSIONS.....	4

LIST OF FIGURES

FIGURE 1	GENERAL LOCATION MAP
FIGURE 2	PROJECT LOCATION MAP

LIST OF APPENDICES

APPENDIX A	FROZEN SERVICE OVERVIEW MAP
APPENDIX B	2015 NIAGARA FALLS 72 ND STREET WATER SERVICES INVESTIGATION
APPENDIX C	OPINION OF PROBABLE COSTS

I. General

Recently, multiple homes along 72nd Street in the City of Niagara Falls have experienced frozen water services during the winter months. Many residents in the area have been without water for weeks during the previous winter because of the frozen services. In some cases, the Niagara Falls Water Board (NFWB) has established a “Drip Plan” for these residents, instructing them to keep water running in one tap of their home from December 15 to March 31. NFWB recommends the water is run with the flow at approximately 1/8” diameter, to prevent water service freezing.

In 2010, 72nd Street underwent a Road Reconstruction project, where approximately 5,000 feet of road was replaced. During this project, only 2,000 feet of water main underneath the roadway was replaced. In 2010, only three homes on 72nd Street were on the “Drip Program.” However, after the road reconstruction project, the number of residences on the “Drip Program” increased to 53. The affected areas that are subject to freezing occur within the section of water main that was not replaced during the 2010 project. A map outlining the houses in the “Drip Program” and with documented frozen pipes can be found in Appendix A.

The City is considering alternatives that will permanently resolve the ongoing problem along 72nd Street. The goal of this report is to identify a viable means to provide the residents of the area with a safe and reliable potable water source.

II. Project Area

A. Location

The City of Niagara Falls is located in southwest Niagara County and is adjacent to the Niagara River. A Location map of the city can be found on Figure 1.

B. Environmental Resources Present

The community is made up entirely of residential properties. The area of concern does not contain any State or Federal wetlands, or any creeks or tributaries. None of the properties in the City are located in a NYS Certified Agriculture District.

According to the NY State Historic Preservation Office mapping, 72nd Street is not located within a designated Archeologically Sensitive Area.

According to a National Resources Conservation Service Web Soil Survey, much of the soil in the area is Canandaigua Silt Loam, a soil with a high susceptibility to frost action, meaning much of the shallow soil the pipes are buried in will freeze multiple times during the cold winter months.

III. Existing Facilities

A. Location Map

The project area is located along approximately 3,300 feet of 72nd Street in the City of Niagara Falls between Niagara Falls Boulevard (US Route 62) and Stephenson Avenue, as shown on Figure 2.

B. Existing Water Supply

The residents along 72nd Street are currently served by a public water system, consisting of 6" cast iron water main and individual water services of different sizes and materials, operated and maintained by the Niagara Falls Water Board.

According to a 2015 report titled "Niagara Falls 72nd Street Water Services Investigation" written by Clark Patterson Lee, after excavating and inspecting certain water services that had experienced freezing in winter, it was found that these pipes have less than 36 inches of cover in some locations. The water main itself was found to be less than 40 inches beneath the ground. Since the water main and services were found in such shallow locations, they do not have the insulation from the soil to prevent freezing. In period of cold weather, this can cause both the shallow water mains and water services to freeze multiple times throughout the year, and cause maximum stress on the pipes. The above mentioned report can be found in Appendix B.

IV. Need for Project

A. Health and Safety

In recent years, due to freezing pipes, more than 10 residents per year along 72nd Street have been without water for days or even weeks at a time. It is the mission of the City of Niagara Falls to provide the residents with a safe and reliable source of public potable water. Therefore it is necessary to establish an alternative that will alleviate the health concerns and safety concerns that depend on the reliability of public potable water.

B. System O & M

The freezing of pipes in the area can possibly cause damage to the water main and water services that do not have enough soil insulation around them, and are above the frost line. When the ground becomes frozen, and the pipes freeze multiple times in a winter, it can cause rupturing and leaking throughout the system or on residential properties. Therefore installing the main and services deeper into the ground can protect the pipes from bursting and prevent possible flooding in the area. These freeze events can cause ongoing damage to water mains and services and result in continuous costs and maintenance hours for both the residents and the City and Board employees.

V. Alternatives Considered

A. Description

1. Existing System – Null Alternative
Estimated Capital Cost: \$0

This alternative proposes to “do nothing”. The water system would continue to freeze in winter months, with residents continuing to run water in their homes to prevent freezing. If pipes do freeze in the area, it will result in the further deterioration of existing main and water services, as well as increased health concerns and water shortages to the homeowners in the area.

2. Alternative 1 – New Distribution System
Estimated Capital Cost: \$676,400

This alternative proposes to replace approximately 3,300 feet of 6” cast iron water main with new 8” ductile iron water main at a proper depth along 72nd Street along with all existing water services. The new water main will be installed with fire protection capabilities with hydrants and necessary residual pressure. The potable water will continue to be provided by the Niagara Falls Water Board.

B. Design Criteria

The 72nd Street Water Improvements will be designed in accordance with the Recommended Standards for Water Works and the NYS Department of Health.

C. Environmental Impacts

There are no anticipated negative environmental impacts associated with the project. However, an environmental review will be done for the project. All construction will be done in existing road Right-of-Ways or legal easements, and proper construction mitigation and restoration efforts will be implemented.

D. Advantages/Disadvantages

Although there are significant costs associated with Alternative 1, it is the most viable way to address the water system deficiencies, including both the freezing of the water main itself, as well as the residential water services.

E. Recommended Alternative

The recommended alternative is Alternative 1: New Distribution System for the City of Niagara Falls 72nd Street. The potable water will be provided by the Niagara Falls Water

Board. The portion of the water service from the right-of-way to the main line will be installed through this project. The contractor will also make connection to the homeowner's lateral at the curb box. All legal, engineering, administrative, and restoration work will be done in-house using City forces. The proposed cost for the project is approximately \$676,400. An opinion of probable costs can be found in Appendix C.

F. Project Schedule

The anticipated project schedule is as follows:

Preliminary Design Complete:	September 2015
Permitting Complete:	October 2015
Final Design Complete:	October 2015
Construction Start:	November 2015
Construction End:	May 2016

VI. Conclusions

The City of Niagara Falls is committed to providing a safe and reliable potable water system to its residents. This specific project will be instrumental in achieving that goal. It is recommended that the City seek funding for completion of the project.

Figures

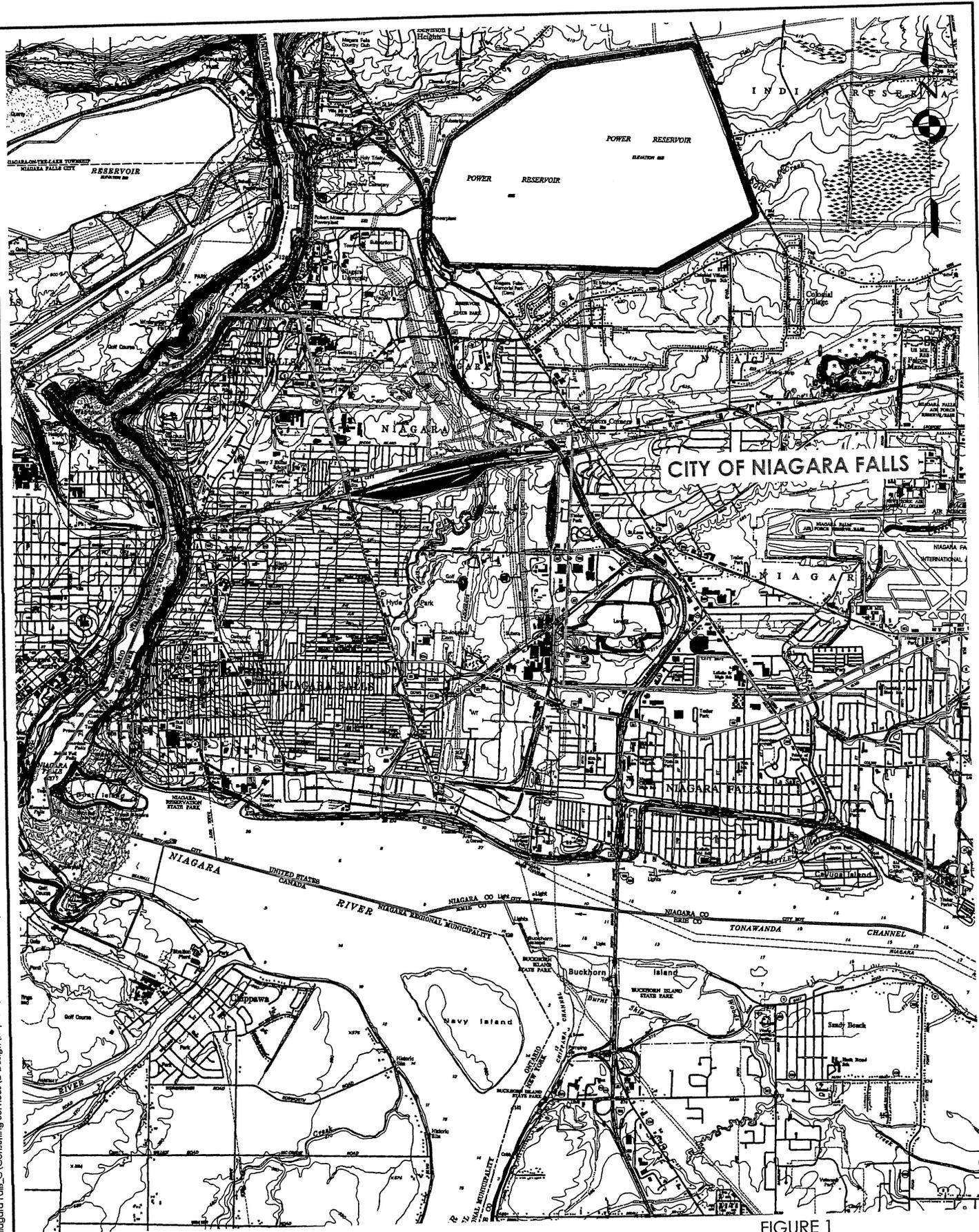
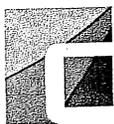


FIGURE 1



CLARK PATTERSON LEE
 DESIGN PROFESSIONALS
 26 MISSISSIPPI STREET, SUITE 300
 BUFFALO, NEW YORK 14203
 TEL (716)852-2100
 FAX (716)852-2120
 www.clarkpatterson.com

DATE: 8/24/15
 DRAWN: DGI
 CHECKED: ARK
 SCALE: 1"=5000'
 PROJ. #: AS NOTED

GENERAL LOCATION MAP
 72ND STREET INVESTIGATION
 NIAGARA FALLS, NEW YORK

Referenced Drawings: None
 Drawing Name: J:\PROJECTS\Niagara Falls_C\Consulting Services\Design\Reports\NF Water Main Study\72nd Street Investigation\Map Plan Report\Figures\Location Maps.dwg
 Date last accessed: 8/24/2015 4:49 PM
 Date last plotted: 8/26/2015 4:01 PM
 Plotted by: Dan Insinn

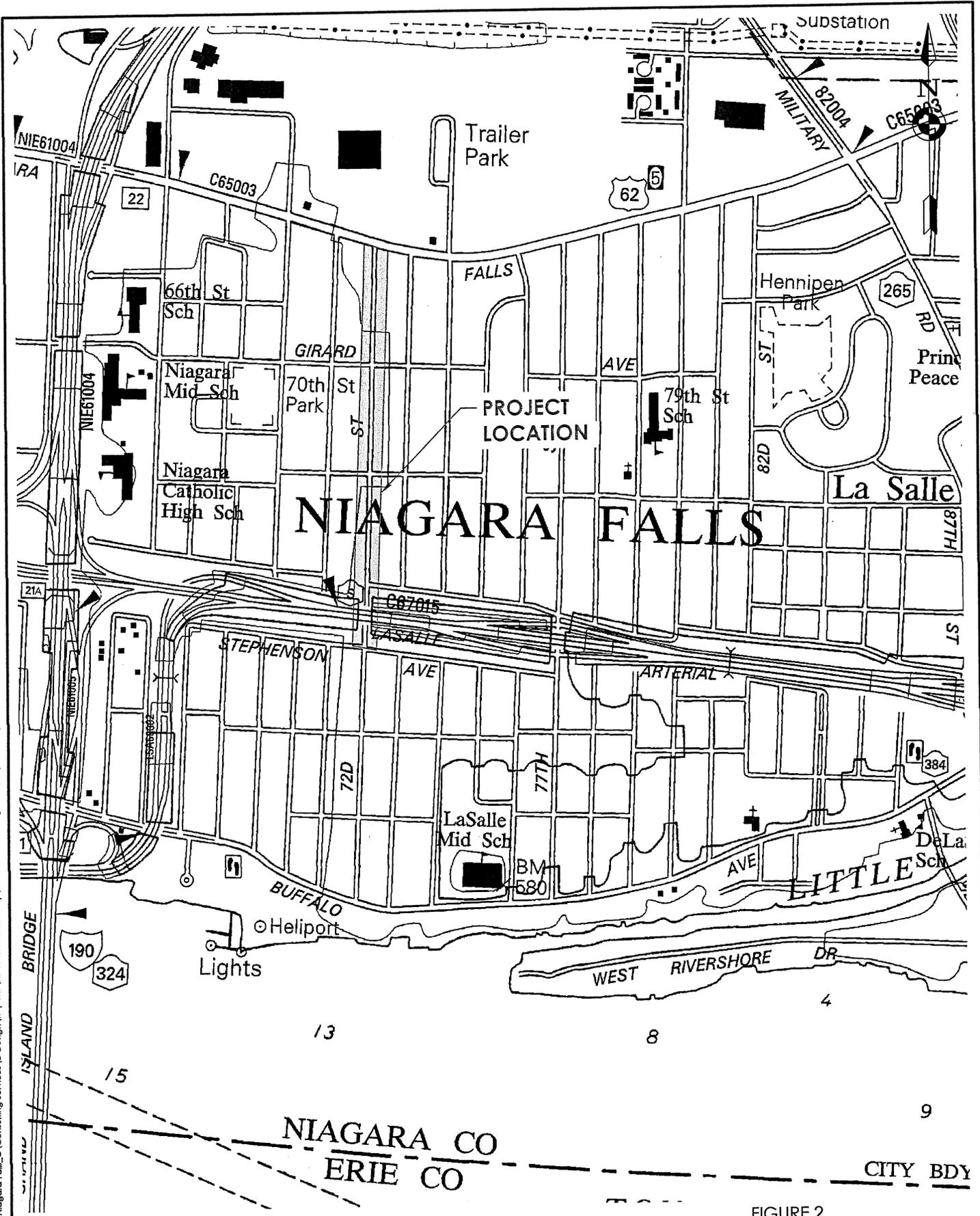


FIGURE 2



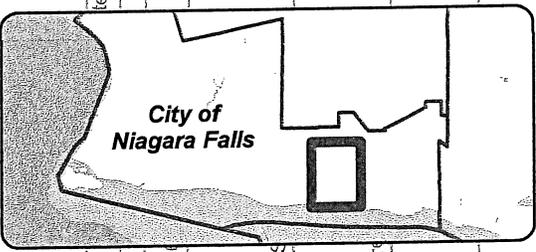
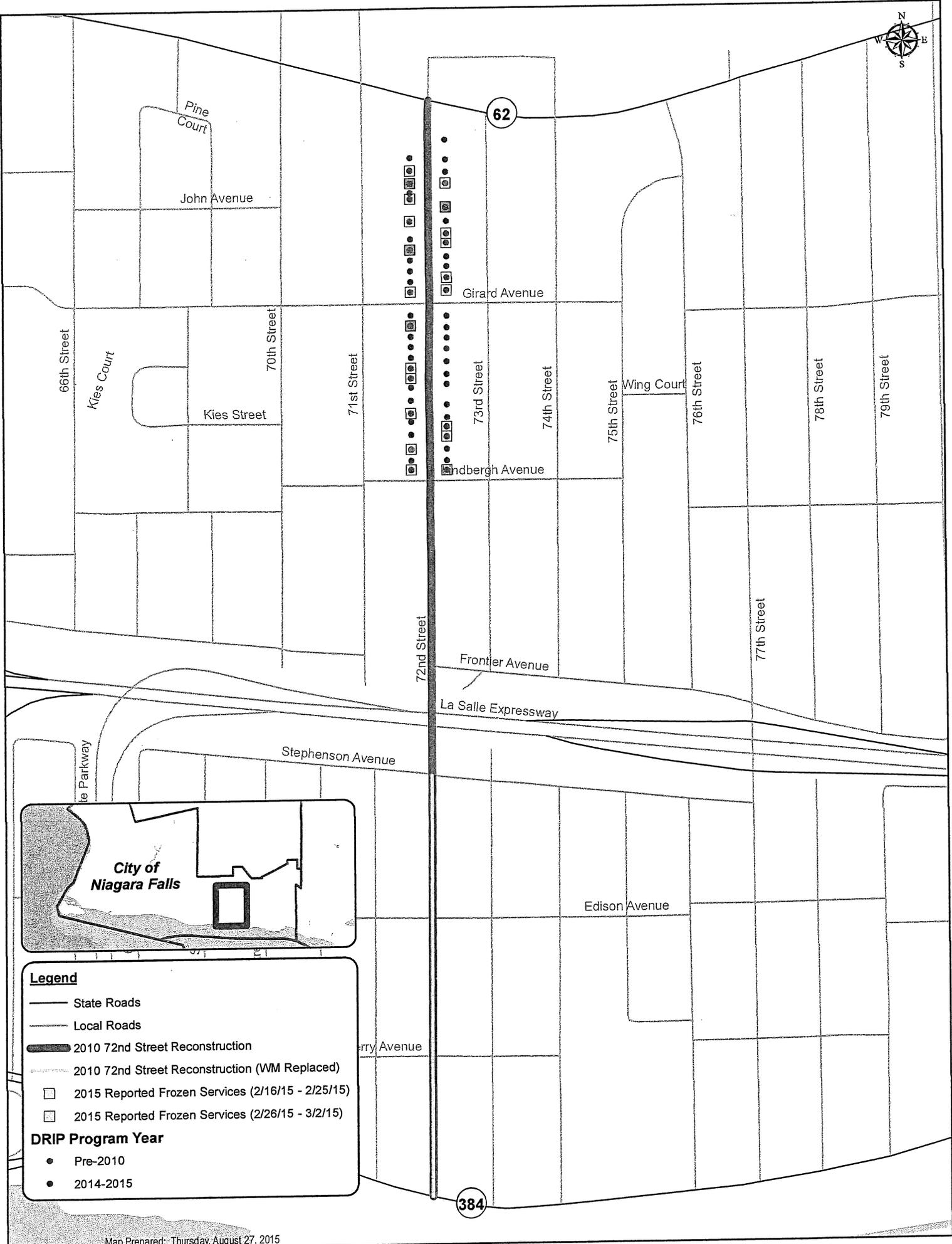
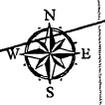
CLARK PATTERSON LEE
 DESIGN PROFESSIONALS
 26 MISSISSIPPI STREET, SUITE 300
 BUFFALO, NEW YORK 14203
 TEL (716)852-2100
 FAX (716)852-2120
 www.clarkpatterson.com

DATE: 8/24/15
 DRAWN: DGI
 CHECKED: ARK
 SCALE: 1"=1000'
 PROJ. #: AS NOTED

GENERAL LOCATION MAP
 72ND STREET INVESTIGATION
 NIAGARA FALLS, NEW YORK

Appendix A

Frozen Service Overview Map



Legend

- State Roads
- Local Roads
- 2010 72nd Street Reconstruction
- 2010 72nd Street Reconstruction (WM Replaced)
- 2015 Reported Frozen Services (2/16/15 - 2/25/15)
- 2015 Reported Frozen Services (2/26/15 - 3/2/15)

DRIP Program Year

- Pre-2010
- 2014-2015

Appendix B

**2015 Niagara Falls 72nd Street
Water Services Investigation**

REPORT

NIAGARA FALLS 72ND STREET WATER SERVICES
INVESTIGATION

CLARK PATTERSON LEE

5/27/2015 & 5/28/2015

At request of the City of Niagara Falls (City), Clark Patterson Lee had an inspector present for exploratory digs on 72nd Street in the City. The digs were administered by Glynn Geotechnical Engineering (GGE) as consultant to the Niagara Falls Water Board (Water Board). J.R. Swanson Plumbing (JRS) provided excavation and plumbing for the investigation as subcontractor to GGE.

Excavation began on 5/27/2015 at 9:30 AM at #602 72nd St. There were 2 representatives from GGE, 1 from the Water Board, and 1 from CPL. JRS had 1 operator, 1 truck driver, and 2 plumbers working with a u55 Kubota mini-excavator, work van, and single axle dump truck. At that time some media personnel were hovering around the work site taking photos and asking questions. The excavation area was 23 FT from curb towards center of road, and 3.5 FT in width. The excavation was continued beyond the curb to the valve-box also. Figure 1 shows the excavation.

Behind the curb the soils were a sandy-clay material, reddish brown. GGE took a sample of this material, as well as samples of the other materials excavated in the street. The service was found to be a 1½" lead pipe. The top of the service/valve connection was 47" below grade.

By 10:00 AM many more media crews were present as well as local residents and politicians. There were as many as 25 individuals on site, discounting the work crew. There were no demarcations made between work site and public areas. At this time excavation in the road revealed a thickened and reinforced road section. Figure 2 shows the typical road section. Because the service meandered and the crown of the road the service was at various depths to the water main, but was in subgrade soils, not in stone. The service was connected to the main at the 12 o' clock position (Figure 3) but was not totally exposed.

DISTANCE FROM CURB	3 FT	6 FT	10 FT	15 FT	18 FT	21 FT	21 FT (WATER MAIN)
DEPTH TO TOP OF SERVICE	3.6 FT	3.85 FT	3.92 FT	3.56 FT	3.3 FT	2.73 FT	3.26 FT

The excavation at #602 was backfilled with stone and covered with a steel plate. The inspector from CPL left the site at 1:05 PM before JRS backfilled the hole.

Photographs from #602 can be found in Appendix A.

On 5/28/2015 JRS began excavation of water service at #511 72nd St. There was 1 rep from GGE, 1 from CPL, and also the Mayor of NF visited the site. JRS had 1 operator, and 2 plumbers, a single axle dump, mini-excavator, and work van. A sign in the front yard read "House for Sale Water Seasonal". The area to be excavated had already been patched (Figure 4) and the operator informed the inspector that while working for another company 2 years prior he had dug up and thawed this lateral. At 9:45 AM JRS began excavation. The excavated area was 11.5 FT Wide x 4 FT Long. One plumber reported that he had measured down the riser to the valve box in the concrete driveway and reported the depth to be 26 inches (Figure 4, valve at center).

After excavation a 1" copper service was found, tapped to the water main at 60 degrees from horizontal (Figure 5). This is a deviation from the 90 degree tap found at #602. Roughly 10 FT of the service was insulated with fiberglass insulation (Figure 5&6) and a significant portion of the road section was replaced with sand fill instead of stone. Perhaps as much as 12" of stone was replaced with sand by the contractor in an effort to help insulate the service. The sand material was removed and disposed of. A short section of the excavation was not disturbed in the emergency dig and had the same typical section as at #602.

LOCATION	NEAR CURB	AT THE MAIN	TOP OF MAIN
DEPTH OF SERVICE	2.6 FT	2.43 FT	3.27 FT

The CPL inspector left the site at 11:15 AM prior to backfilling.

Photographs from #511 can be found in Appendix B.

FIGURE 1

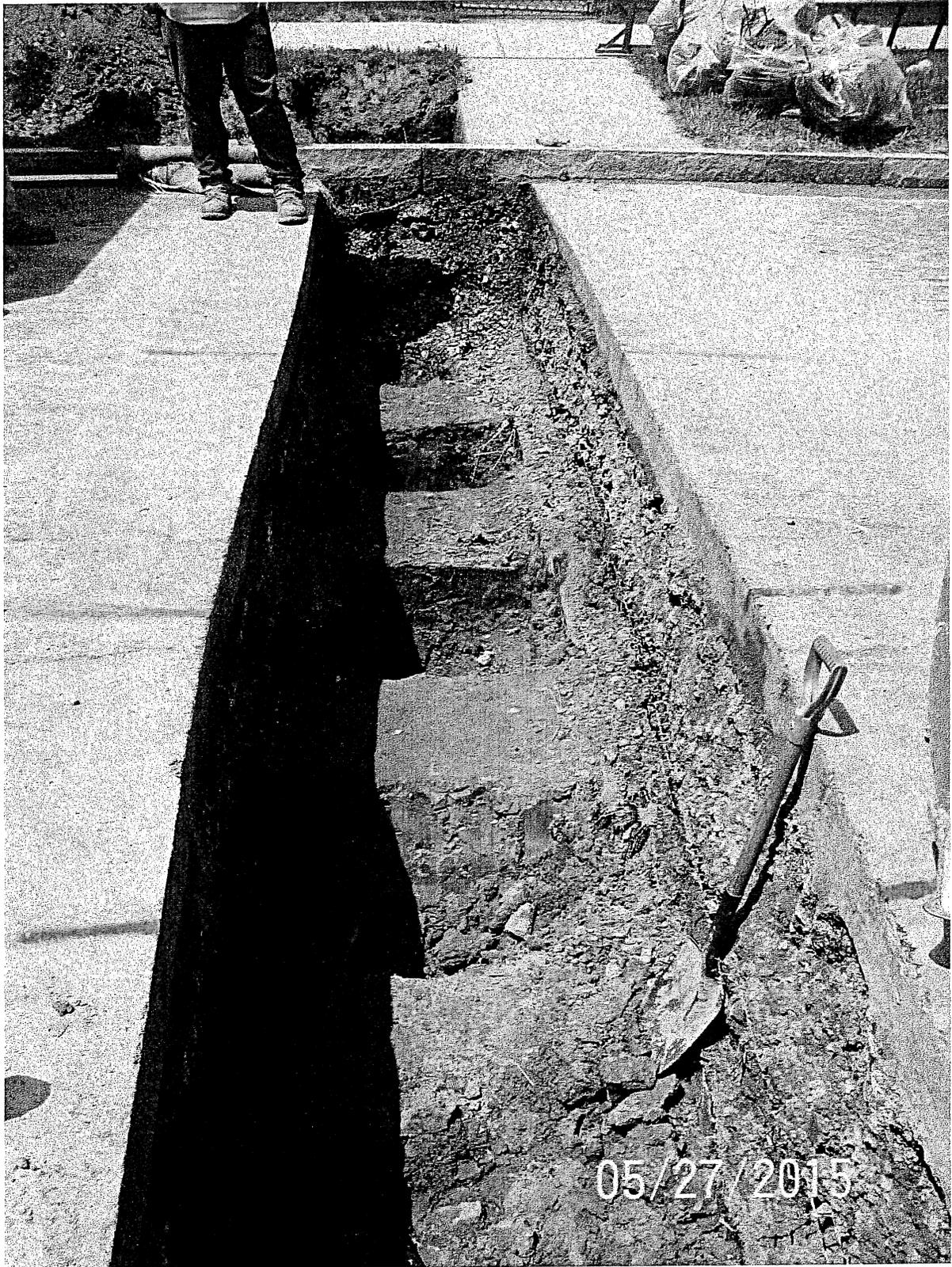


FIGURE 2

TYPICAL SECTION
72ND STREET

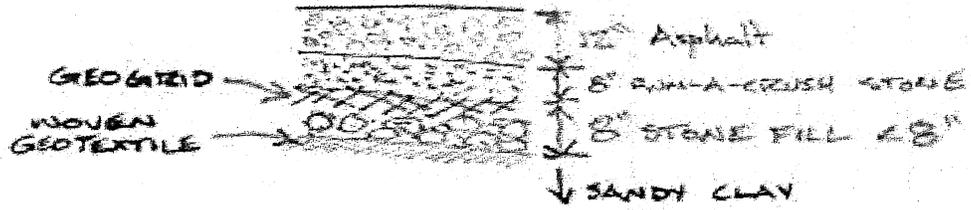


FIGURE 3



FIGURE 4



FIGURE 5

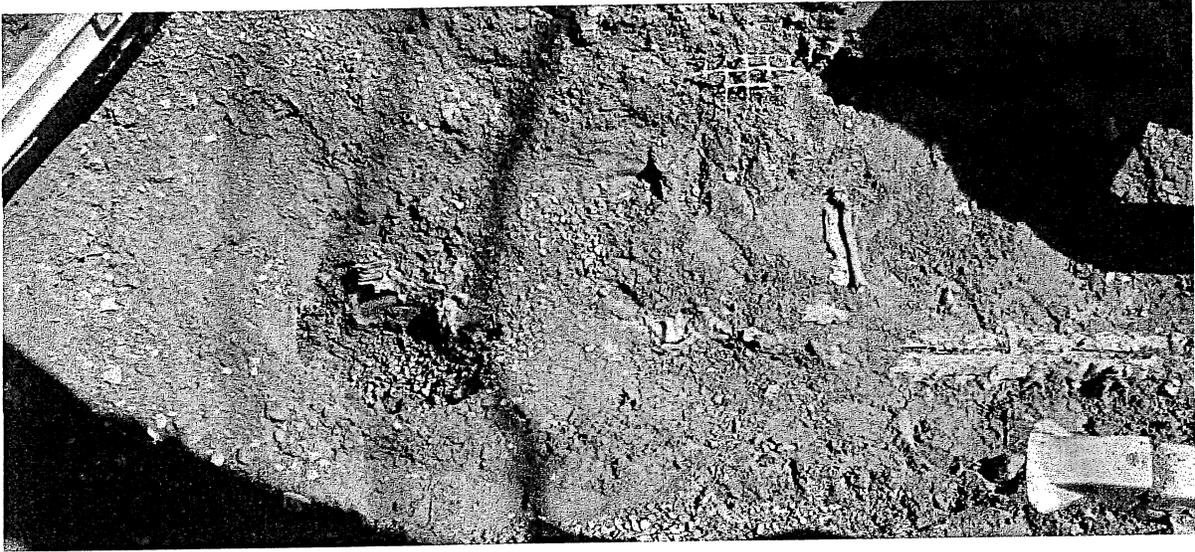


FIGURE 6



Appendix C

Opinion of Probable Costs

CITY OF NIAGARA FALLS
72ND STREET WATER MAIN REPLACEMENT
OPINION OF PROBABLE COSTS

Date: 8/31/2015

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1	Furnish and Install 8-Inch Class 52 Ductile Iron Pipe	LF	3,300	\$75	\$247,500
2	Furnish and Install Hydrant Assembly	EA	8	\$6,000	\$48,000
3	Furnish and Install 8-Inch Gate Valve Complete	EA	13	\$2,000	\$26,000
4	Reconnect Existing Long-Side Service Complete	EA	43	\$2,400	\$103,200
5	Reconnect Existing Short-Side Service Complete	EA	40	\$1,600	\$64,000
6	Connection to Existing Water Main	EA	7	\$5,000	\$35,000
7	Temporary Asphalt Installation	SY	1,500	\$30	\$45,000
8	Rock Excavation	CY	300	\$75	\$22,500
9	Maintenance and Protection of Traffic Including Signs and Flagmen Meeting NYSDOT Requirements	LS	1	\$11,824	\$11,824
10	Mobilization	LS	1	\$11,824	\$11,824

SUBTOTAL = \$614,848
 CONTINGENCY (10%) = \$61,485
 LEGAL, ENGINEERING & ADMINISTRATION (0%) = \$0
 TOTAL = \$676,333
TOTAL ESTIMATED CONSTRUCTION COST = \$676,400

Notes:

- Assumes the water main can be installed with conventional method under the LaSalle Expressway overpass.
- Assumes "Local Road Closure" signs can be used, limiting traffic to local residents only and buses.
- Assumes tying into the existing main at Niagara Falls Blvd at the southern edge of the ROW, not encroaching into the Blvd.
- Assumes old valves and hydrants will be removed in a separate contract in the Spring.
- Assumes temporary asphalt will be used in areas where sidewalk is cut.
- Assumes temporary asphalt only in the roadways.
- Assumes the water main will be installed in one of the travel lanes.