



Lake Claire Water Association  
c/o Mr. Bob Korvas, President  
207 Thierry Lane  
Prospect Heights, Illinois 60070

July 25, 2006

***Subject: Lake Claire Water Association –  
Preliminary Engineering Study - Water Main Extension***

Dear Officers, Directors and Members:

We were authorized by Mr. Bob Korvas, President of the Lake Claire Water Association (LCWA) on June 29, 2006 to provide the Association with a study and 30 percent design plans for the construction of water mains, from the City of Prospect Heights (City) water system on Camp McDonald Road, along Wheeling Road and throughout the Lake Claire neighborhood. This report is a summary of our study and includes recommendations and an opinion of probable cost for the water main extension to serve the LCWA. Although this study, report and preliminary plans were authorized by LCWA, the proposed water main extension final design and construction would be a City authorized project, funded by the LCWA.

The study includes a review of alternative routes and pipe materials for the water mains, a review of City and Prospect Heights Fire District (Fire District) requirements, evaluations of the City's water system to provide water to the service area, permit and utility contact requirements, an opinion of probable cost for the recommended water main route, and 30 percent design plans showing the proposed water mains, rights-of-way and proposed easements, property lines and addresses, driveway schematics, underground utility locations taken from available maps and

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markings in the field, and street names. The 30 percent design plans are included with this report as a separate document.

### **Existing Facilities**

The boundaries of the service area are the north side of Camp McDonald Road, from the Orchards of Ann to Wheeling Road; both sides of Wheeling Road, from Camp McDonald Road to Willow Road; the north and south property lines of the Lake Claire development; and the east end of Newcastle Lane, where it becomes Coldren Drive. The service area is currently served with individual private water wells, sanitary sewers, open ditches and culverts and some storm sewers for drainage.

The City owns and operates an existing water system consisting of storage reservoirs, pumps, and water mains. The City purchases Lake Michigan water from the Illinois American Water Company and stores and pumps the water into the City's system. Most of the existing water mains in the City's system are located in and around the Rob Roy Country Club. The LCWA water main extension project would connect to an existing 12-inch water main located on the north side of Camp McDonald Road at the Orchards of Ann subdivision.

During normal flow demand periods, the City uses pressure provided by Illinois American and pumping is not necessary. During periods of increased water



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usage, the City relies on its pumping equipment to provide the flow rate and adequate pressure in the system.

The pumping facilities consist of four pumps with the following capacities:

Pump No. 1	150 gallons per minute
Pump No. 2	250 gallons per minute
Pump No. 3	1,000 gallons per minute*
Pump No. 4	1,000 gallons per minute*

\*Pumps No. 3 and 4 alternate, and do not operate at the same time.

The pumps provide an operating pressure of 50 to 64 pounds per square inch (psi), which is equivalent to a hydraulic grade line elevation of approximately 765 to 795. A hydraulic grade line is similar to the water surface elevation in an elevated tank (water tower) if an elevated tank was connected to the water system. Municipal water systems typically have water pressures in the range of 40 psi to 75 psi, and the City's water system pressures are within this range.

The existing average daily water usage for 2005 was 134,400 gallons per day (gpd), or 93 gallons per minute (gpm). Peak hourly flow rates in a water system can be 2.5 to 3 times the average daily flow rate, so the City's existing peak hourly flow rates could be approximately 250 to 300 gpm.

Using a design flow rate of 100 gallons per day per person, and a typical population of 3.5 persons per single family house for the 160 lots in the LCWA, it is anticipated the average daily flow would increase by 56,000 gpd, or 40 gpm. The

peak hourly flow rate is therefore anticipated to increase by 100 to 120 gpm, for a total peak hourly flow rate of approximately 350 to 425 gpm.

A water supply (pumping) system should be able to provide the peak hourly flow rate with its largest pump out of service. The City's system can provide 400 gpm without the use of either one of the large pumps, so the system will be able to meet the demands after the addition of the LCWA.

A water storage system should be able to provide two days of average daily usage or a volume of water equal to the fire flow and peak hourly flow rate for a duration of two to four hours, depending on the fire flow rate. The City's storage facilities consist of a 300,000 gallon ground storage reservoir (east) and a 250,000 gallon ground storage reservoir (west). The combined storage of 550,000 gallons exceeds the 380,000 gallons needed for two days of average daily flow (134,400 gpd (Existing) plus LCWA 56,000 gpd (LCWA) = approximately 190,000 gpd x 2 days = 380,000 gallons).

The storage volume necessary to meet fire fighting demands is established by the Insurance Services Office (ISO) and is dependent on the fire flow rate. For neighborhoods similar to the LCWA, a fire flow rate of 750 gpm is recommended for a duration of 2 hours. Again, the 550,000 gallons of storage easily exceeds the 108,000 gallons needed to meet the fire and average daily flow demand for two hours

(750 gpm (fire) plus 93 gpm (existing) plus 40 gpm (LCWA) average flow = approximately 900 gpm x 2 hours x 60 minutes/hour = 108,000 gallons).

A water system should also be able to provide the recommended fire flow rate with a minimum 20 psi pressure in the water system. Although an extensive water system analysis is beyond the scope of this study, calculations indicate the proposed water main extension would provide 750 gpm at the far northeastern end of the LCWA service area with a pressure loss of approximately 20 psi. With a system pressure between 50 psi to 64 psi, there should be approximately 30 to 44 psi residual pressure in the water system, which is above the 20 psi minimum pressure. Therefore the existing water mains and the proposed water main extension will provide adequate fire protection to the LCWA.

#### **Alternative Routes**

We developed alternative routes for the proposed water main extension and for future water main connections and extensions to serve adjacent areas. Early in the study, the City indicated the water main extending from the existing water main to the north end of the main along Wheeling Road would be a 12-inch pipe. We concur with the sizing of this pipe as a 12-inch pipe to provide fire flow demands with adequate water pressure. A 12-inch pipe would provide capacity for future



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water system expansion/extensions, but its primary function for this project is to provide adequate fire flow and pressure to the LCWA.

The water main along Wheeling Road is anticipated to be located on the east side of the right-of-way. The east half of the right-of-way varies from a 33 foot wide easement for road purposes only (water main easements would be necessary) to a dedicated 50 foot wide half right-of-way for two lots and for the Lake Claire development lots (no easements necessary).

The west half of the right-of-way is 50 feet wide, but there is an Old Town Sanitary District sewer, a Metropolitan Sanitary District sewer, a natural gas main and several underground telephone ducts making locating the water main on the west side problematic. In addition, using the west side would require multiple expensive jacked casing crossings of Wheeling Road, four street crossings and more driveway crossings.

Although not included in this project, it would be advantageous to the LCWA and adjacent developments to have water mains connecting LCWA and adjacent neighborhoods, when and if other neighborhoods are served by water mains. These additional water mains would greatly improve water pressures, fire fighting capabilities, and water quality. These additional water mains would serve to “loop”

the water system, thereby eliminating some dead-end water mains and providing additional sources of water to the LCWA neighborhood.

The selected water main route is shown in the 30 percent design plans, and represents the anticipated locations for the water main. There may be minor location changes at the time of final design to address sewer separation and utility conflict issues.

### **Pipe Materials**

There are three common pipe materials used for water main construction – ductile iron, polyvinyl chloride plastic and high density polyethylene plastic. The use of these pipe materials is often dictated by the water utility based on past use, experience, preferences and specific construction requirements.

Ductile iron (DI) pipe is a readily available pipe material accepted and used in the majority of water systems throughout the country. It is strong and durable, and water system owners, operators and maintenance crews are familiar with installation and repair methods. DI pipe is most often joined using push-on rubber gasket compression joints, although mechanical (bolted) rubber gasketed joints with stainless steel or Corten steel bolts and nuts are usually used for fittings, valves and fire hydrants. Fittings in water systems are braced to resist water pressure using

concrete thrust blocks or restrained joint systems. Restrained joints can readily be installed on DI pipe.

DI pipe is subject to exterior corrosion from different types of soils or stray electric currents from adjacent pipelines. Where corrosion could be a problem, ductile iron pipe, fittings, valves and fire hydrants are wrapped with a polyethylene (plastic) sheet or tube. Many water systems require all ductile iron pipe and appurtenances to be wrapped with polyethylene to eliminate any concern about exterior corrosion. We often recommend the installation of polyethylene wrapping unless soils and surrounding conditions are known to be non-corrosive. The small incremental increase in cost is often worth the protection provided by the polyethylene wrapping.

The installation of DI pipe often includes the installation of conductive wedges or gaskets, or cables connecting individual pipe sections. The wedges and cables are used to improve pipe locating abilities, and can provide a way to thaw frozen water mains, although the depth of cover (bury) of water mains has increased over the last few decades to minimize the chance of a water main freezing.

Polyvinyl Chloride (PVC) pipe is an alternative to ductile iron pipe in the majority of water systems. PVC pipe is most often joined using rubber gasket compression joints, although mechanical (bolted) rubber gasketed joints are usually

used for fittings, valves and fire hydrants. As with DI pipe, fittings are braced to resist water pressure using concrete thrust blocks or restrained joint systems. Restrained joints can readily be installed on PVC pipe, although the material and effort to do so is more involved than for ductile iron pipe.

PVC pipe is not subject to corrosive soils and stray currents as is DI pipe. With PVC pipe outside dimensions matching DI pipe; fittings, valves, and fire hydrants can be installed in a PVC pipe water system just as they would be installed in a DI pipe system. Repairs in a PVC pipe water system are similar to the repairs needed with DI pipe.

There are two standards used for PVC water main pipe. The American Water Works Association (AWWA) has written standards C-900 and C-909 for PVC plastic water main pipe, and water system owners and operators recognize AWWA standards as industry standards. The major difference between the two standards is the way the pipe material is manufactured and formed. When C-900 pipe cracks or ruptures, it usually does so with a crack along the long axis of the pipe, ruining a section (20 foot long) of pipe. When C-909 pipe breaks, it usually results in a crack around the circumference of the pipe, which can be repaired with a relatively short repair clamp. While C-900 pipe has been accepted for decades, the relatively new C-909 pipe is gaining acceptance. The decision to use either or both types of PVC



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plastic water main pipe is determined by the water system owner's preferences, specifications and standards.

The third pipe material used for water main construction is high density polyethylene (HDPE) pipe. This material is very flexible and pipe sections are joined with a heat fusion process forming very long lengths of pipe with joints stronger than the pipe itself. HDPE pipe is usually used for specific purposes such as horizontal directional drilling or long, large diameter water transmission mains. The use of HDPE pipe for water mains in an area similar to the LCWA becomes very burdensome because of the equipment and effort needed to make the heat fused joints. Except for specific purposes, HDPE pipe is rarely used as a water main pipe material. In addition, providing and installing HDPE pipe for this project would be more expensive than using DI or PVC plastic pipe.

Based on the above and discussions with City staff, we recommend the use of DI pipe for the construction of the LCWA water main project. Polyethylene wrapping will probably be used only in those areas where corrosive soil conditions are indicated during construction.

#### **Permits/Utilities/Easements**

All water main extensions require Illinois Environmental Protection Agency (IEPA) construction and operating permits from the IEPA Division of Public Water



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Supplies. Once the final design plans and specifications were completed, a permit application would be prepared, signed by the City, and sent to the IEPA. An IEPA permit review and issuance normally takes between 45 and 60 days. With the issuance of an IEPA-DPWS permit, the project can be constructed.

Once the water mains are constructed and pressure and leakage tested, the mains are disinfected, flushed with clean water and sampled and tested to verify the water mains are acceptable for use. After successful testing, an operating permit is issued and the water mains can be used for water supply and fire fighting purposes.

A Cook County Highway Department permit would be required for work within the Camp McDonald Road and Wheeling Road rights-of-way. The permit submittal would be part of the final design phase of the project, and it is anticipated to take between 4 weeks and 8 weeks to obtain such a permit.

We anticipate no need for any construction in wetlands, in or around streams or creeks, or in any historic areas. However, we often submit project information to the Illinois Historical Preservation Agency, the Illinois Department of Natural Resources/Endangered Species section, and the U.S. Fish & Wildlife Service to expedite the IEPA-DPWS permitting process.

As part of the initial design phase of the project, we contacted Joint Utility Locating Information for Excavators (JULIE) to obtain Design Stage planning



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information for electric, telephone, cable TV, petroleum pipelines, water mains, sanitary and storm sewer and other underground utilities. JULIE is an organization formed to minimize the disruption and expense caused by contractors excavating in and around, and possibly cutting into, existing underground facilities. We called JULIE to have the various utilities send us maps of their existing underground utilities. The location of existing facilities often determines the alternatives and routes for the installation of new facilities. We obtained information from Nicor (natural gas), ComEd (electric), and the Old Town Sanitary District. In addition, our preliminary survey indicated the location of various storm sewers and a Metropolitan Water Reclamation District of Greater Chicago interceptor sewer on each side of Wheeling Road. The survey to be completed during the final design phase of the project would provide additional and more precise utility locations for construction purposes. These utilities are shown on the 30 percent design plan sheets included with this report.

As discussed earlier, easements will be needed for the construction of the recommended water main route. The properties along the east side of Wheeling Road and south of the Lake Claire development are platted with their western property line at the centerline of Wheeling Road. These lots appear to include a 33 foot wide easement for roadway purposes, but a separate easement would be required



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to construct the water main, whether or not the main was located within the 33 foot roadway easement. It would be preferable to obtain 50 foot wide water main easements, to provide a 17 foot wide water main easement and a 33 foot wide construction easement. The 50 foot wide easements would correspond to the 50 foot half rights-of-way on two of the Wheeling Road lots and the lots within the Lake Claire development. Easement acquisition would require preparing the descriptions, drawings and terms of the easements; negotiations and acquisition. The easements should not affect the use of the properties as there are existing building setback lines, and the property owners could still use the easements for landscaping, driveways, and drive turnarounds.

#### **Fire District and City Requirements**

We contacted the Fire District and met with City staff to discuss the various requirements for the water main extension. The Fire District was understandably concerned about fire hydrant spacing and specifications. The specifications will be included in the final design, and we have included the recommended spacing of approximately 300 feet between fire hydrants in the 30 percent design plans. The 300 foot spacing is a general rule, and there are some areas where the spacing is slightly more than 300 feet due to street right-of-way and property line locations.

Fire hydrants were placed at all street intersections and intermittently at property lines to avoid conflicts with driveways and for aesthetic reasons.

An adequate number of water main valves have been provided to minimize the amount of water main to be taken out of service for repair or hydrant flushing purposes. Future water main extensions would include new valves as part of those projects so as to minimize the number of valves needed for this project. Valve construction and protection were considered in this preliminary design phase, and valve specifications will be included during the final design of the project.

**Opinion of Probable Cost**

This entire project will be funded by the LCWA, with each property owner sharing in the cost of the project. There are several methods of dividing the cost between property owners, including sharing the cost: (1) as a percentage of the property's value (as a tax rate); (2) as a percentage of the amount of water main along the property lines (length of water main); (3) as a percentage of the land area of each lot (lot size); and (4) equally between all property owners. The first three methods unfairly increase the cost to larger, more expensive properties while the water main provides the same service to all properties. The fourth method is the most equitable and easiest to justify and implement. All properties receive the same



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benefit from the water main (water service and fire protection), and therefore each property owner shares equally in the cost of the project.

We prepared a detailed Opinion of Probable Construction Cost for the project shown in the 30 percent design phase drawings. The Opinion of Cost is included in this report as Exhibit 1. The costs shown in Exhibit 1 are based on recent bid prices for similar work in Northeastern Illinois areas. The following is a summary of estimated total project costs:

Opinion of Probable Construction Cost	\$2,111,000
Engineering – Design	\$ 69,800
Engineering – Construction	\$ 100,000
Administration (City)	\$ 9,500
Administration (County)	\$ 9,500
Legal (SSA)	\$ 19,000
Engineering/Surveyor (11 Easements)	\$ 27,000
Easement Acquisition	\$ 16,200
Total Project Cost	\$2,362,000
Estimated Cost per Property Owner for Water Service (160 total lots)	\$ 14,763
	Say \$ 14,800
Repaving Contingency	\$ 150,000
Estimated Cost per Property Owner for Repaving (160 lots)	\$938
	Say \$ 1,000
Opinion of Probable Total Project Cost per Property Owner	Say \$ 15,800

In addition to the above per lot costs, the City has a water connection charge and each property owner would be responsible to contract with a plumber to install a service pipe from the property line to the building plumbing. The City's connection



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charge is currently set at \$600 per connection and would be paid to the City as a cost separate from the funding/financing of the Special Service Area. The cost to extend the service line from the property line to the house would be different for each individual building and is not a part of this study.

**St. Alphonsus Parish & School**

We were requested to include a water main extension to the St. Alphonsus Parish & School as part of this project. We met with Mr. Ed Janus and Mr. Ed Sawicki of St. Alphonsus and they agreed to have us provide an Opinion of Probable Cost and description of the construction necessary to extend the water main along Wheeling Road to serve the church and school buildings.

The water main extension required to serve St. Alphonsus would be an extension of the 12-inch water main along Wheeling Road, from the north right-of-way line of Willow Road to the north side of the south entrance drive of the parish/school property. The water main would be located in the 50 foot east half right-of-way of Wheeling Road and would be installed in an open cut trench. A short section of 8-inch pipe with an 8-inch valve is proposed at the west property line of the parish property. The 8-inch size was selected because the cost difference between an 8-inch pipe and a smaller service line is minimal, and the 8-inch size would provide options for the parish to provide more water to the building for



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domestic, irrigation and fire protection/sprinkler purposes. The construction would include complete restoration of the asphalt driveway and lawn area.

An Opinion of Probable Construction Cost for the St. Alphonsus portion of the project is included as Exhibit 2. The unit costs shown in Exhibit 2 are the same as those used for the LCWA Opinion of Probable Cost. The following is a summary of estimated total St. Alphonsus project costs:

Opinion of Probable Construction Cost	\$38,000
Engineering – Design	\$ 2,000
Engineering – Construction	\$ 4,000
Administration (City)	\$ 1,000
Legal (Agreements)	\$ <u>2,000</u>
Total Project Cost for St. Alphonsus	
Water Main Extension	\$47,000

It is anticipated the St. Alphonsus portion of the project would be part of the LCWA water main extension, but would be paid for separately by the parish. The St. Alphonsus portion could only be a separate project after construction of the LCWA water main extension. If the St. Alphonsus portion were designed and constructed as a separate project, economies of scale would apply and costs would increase substantially due to the relatively small project size.

During a meeting with City staff, St. Alphonsus representatives and Baxter & Woodman, Inc. (BWI), BWI was asked to prepare an estimate of the difference in cost between a 12-inch water main and a smaller diameter (3-inch) service pipe along



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the same route and location to serve only the parish property. The excavation, backfill and restoration for a 3-inch pipe are the same as that for a 12-inch pipe. The difference in cost between the two pipes would be based on the pipe size and the labor and equipment to install the pipe. The cost difference is estimated at \$25 per foot of pipe, which for the 300 foot long St. Alphonsus portion of the project would equal approximately \$7,500.

The installation of a 3-inch service pipe would not include a fire hydrant or provisions to extend the pipe to serve other properties. Therefore, the 3-inch pipe would not provide the fire protection or increased water pressures of a 12-inch water main. The construction cost of a 12-inch main is estimated at \$38,000 as shown above, and the construction cost of a 3-inch water service is estimated at \$22,000 (as shown in Exhibit 3). There was discussion about the City paying for the difference in cost between a small pipe and the 12-inch water main. If the City were to pay the \$7,500 increase in cost to go from a 3-inch pipe to a 12-inch pipe, the parish and their insurance provider would need to decide if the improved fire protection, water pressure and decreased insurance premiums were worth the additional \$8,500 cost (\$38,000 - \$22,000 - \$7,500) to the parish/school.

**Summary**

Our discussions with City staff and evaluation of the existing water supply, storage and distribution system indicates the City's existing water system has the capacity to provide adequate water flow rates and pressure for the proposed water main extension. The recommended water main routes are shown on the 30 percent design plans included as a separate attachment to this report, and would consist of approximately 3,050 feet of 12-inch and 8,925 feet of 8-inch water mains, 32 valves, 40 fire hydrants, 160 service connections and complete surface restoration. It is anticipated the water main pipe would be ductile iron, with valves and fire hydrants specified to meet the requirements of the City and the Fire District.

The water main extension project would meet the requirements of the City's Public Works/Water Departments, the Fire District, and the IEPA. Final design would include utility locates and required permit submittals, as well as preliminary/schematic easement descriptions.

The Opinion of Probable Construction Cost for the water main extension project is \$2,111,000 and the Opinion of Probable Total Project Cost for the water main extension project is \$2,362,000. The street pavements throughout the Lake Claire neighborhood will probably have to be repaved due to damage caused by construction traffic, operations and equipment. The cost of the street repaving is



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estimated to be \$150,000. The cost of the project would be paid for by the 160 property owners in the LCWA at a cost of approximately \$15,800 per property owner. Financing and payment arrangements are beyond the scope of this study, but would be included in the Special Service Area Agreement.

The St. Alphonsus Parish & School could be included in the water main extension project. Our Opinion of Probable Total Cost for the St. Alphonsus portion of the project is \$47,000, which would be separate from the cost and financing arrangement of the LCWA.

We trust this report provides the LCWA with adequate information to decide whether or not to proceed with the final design and construction of the water main extensions to provide Lake Michigan/City water to the service area.

If you have any questions or need additional information, please call us.

Very truly yours,

BAXTER & WOODMAN, INC.  
CONSULTING ENGINEERS

A handwritten signature in black ink, appearing to read "Steven M. Verseman". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Steven M. Verseman, P.E.

SMV:mk

Enc.

C: Ed Janus, St. Alphonsus Parish & School  
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**Lake Claire Water Association  
Prospect Heights, Illinois  
Water Main Extension**

**EXHIBIT 1**

Opinion of Probable Construction Cost

Item No.	Description	Quantity Unit	Unit Price	Amount
1.	Water Main (Open Cut)			
	12-inch	2,700 lin.ft.	\$ 65	\$ 175,500
	12-inch restrained joint	75 lin.ft.	\$ 70	\$ 5,250
	8-inch	7,700 lin.ft.	\$ 50	\$ 385,000
	8-inch restrained joint	1,100 lin.ft.	\$ 55	\$ 60,500
	6-inch restrained joint	130 lin.ft.	\$ 55	\$ 7,150
2.	Water Main (In Casing - Open Cut)			
	12-inch R.JT. in 24-inch Casing	25 lin.ft.	\$ 145	\$ 3,625
	8-inch in 18-inch Casing	75 lin.ft.	\$ 110	\$ 8,250
	8-inch R.JT. in 18-inch Casing	50 lin.ft.	\$ 115	\$ 5,750
	Mobilization/Demobilization	6 each	\$ 1,000	\$ 6,000
3.	Water Main (Directionally Drilled)			
	12-inch	250 lin.ft.	\$ 175	\$ 43,750
	Mobilization/Demobilization	2 each	\$ 5,000	\$ 10,000
4.	Water Main Fittings - Restrained Joint Type			
	12-inch x 12-inch Cross	1 each	\$ 1,000	\$ 1,000
	12-inch x 8-inch Tee	2 each	\$ 650	\$ 1,300
	12-inch x 6-inch Tee	11 each	\$ 625	\$ 6,875
	12-inch 22-1/2° Bend	4 each	\$ 575	\$ 2,300
	12-inch Plug	3 each	\$ 500	\$ 1,500
	12-inch Cutting-In Sleeve	1 each	\$ 750	\$ 750
	8-inch x 8-inch Tee	9 each	\$ 550	\$ 4,950
	8-inch x 6-inch Tee	25 each	\$ 525	\$ 13,125
	8-inch x 6-inch Reducer	4 each	\$ 425	\$ 1,700
	8-inch 90° Bend	1 each	\$ 500	\$ 500
	8-inch 45° Bend	2 each	\$ 475	\$ 950
	8-inch 22-1/2° Bend	5 each	\$ 475	\$ 2,375
	8-inch 11-1/4° Bend	2 each	\$ 475	\$ 950
	8-inch Plug or Cap	2 each	\$ 325	\$ 650
	Concrete Thrust Block	2 each	\$ 300	\$ 600
5.	Connections to Existing Water Mains (Pressure with line stop)			
	12-inch x 12-inch with Valve Vault	1 each	\$ 17,500	\$ 17,500
6.	Gate Valve and Valve Box			
	12-inch	5 each	\$ 1,500	\$ 7,500
	8-inch	24 each	\$ 1,200	\$ 28,800
7.	Gate Valve and Valve Vault			
	8-inch in 4 foot diameter vault	2 each	\$ 3,800	\$ 7,600

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**EXHIBIT 1**

Opinion of Probable Construction Cost

Item No.	Description	Quantity Unit	Unit Price	Amount
8.	Fire Hydrant	40 each	\$ 4,000	\$ 160,000
9.	Fire Hydrant Barrel Extension	8 vert.ft.	\$ 300	\$ 2,400
10.	Water Service Connection			
	1-inch	159 each	\$ 500	\$ 79,500
	2-inch	1 each	\$ 1,000	\$ 1,000
11.	Water Service Pipe			
	1-inch - Same side of street	66 each	\$ 500	\$ 33,000
	1-inch - Opposite side of street	72 each	\$ 1,500	\$ 108,000
	1-inch - Opposite side of Wheeling Road	21 each	\$ 2,000	\$ 42,000
	2-inch - Opposite side of Wheeling Road	1 each	\$ 2,500	\$ 2,500
12.	Sanitary Sewer Replacement			
	8-inch pipe	100 lin.ft.	\$ 60	\$ 6,000
	Mobilization/Demobilization	4 each	\$ 1,000	\$ 4,000
	Connection to existing manhole	2 each	\$ 1,000	\$ 2,000
	Connection to existing pipe	6 each	\$ 500	\$ 3,000
13.	Storm Sewer Replacement			
	24-inch pipe	995 lin.ft.	\$ 90	\$ 89,550
	18-inch pipe	330 lin.ft.	\$ 75	\$ 24,750
	15-inch pipe	260 lin.ft.	\$ 65	\$ 16,900
	12-inch pipe	50 lin.ft.	\$ 60	\$ 3,000
	Mobilization/Demobilization	2 each	\$ 1,000	\$ 2,000
	Connection to existing structure/pipe	19 each	\$ 1,000	\$ 19,000
14.	Tree Tunneling (Water Main)			
	Tunnel	300 lin.ft.	\$ 50	\$ 15,000
	Mobilization/Demobilization	14 each	\$ 1,000	\$ 14,000
15.	Removal and Replacement of Unsuitable Material	125 cu.yd.	\$ 80	\$ 10,000
16.	Sanitary Sewer Service Line Repair	57 each	\$ 200	\$ 11,400
17.	Replacement of Drain Tiles			
	8-inch	50 lin.ft.	\$ 25	\$ 1,250
	6-inch	150 lin.ft.	\$ 20	\$ 3,000
18.	Backfilling with Granular Backfill Materials	4,100 lin.ft.	\$ 50	\$ 205,000
19.	Backfilling with Controlled Low Strength Flowable Fill Mixture	250 cu.yd.	\$ 100	\$ 25,000

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Water Main Extension**

**EXHIBIT 1**

**Opinion of Probable Construction Cost**

Item No.	Description	Quantity Unit	Unit Price	Amount
20.	<b>Pavement Restoration</b>			
	Bituminous Street - 4" (Trench)	1,700 sq.yd.	\$ 50	\$ 85,000
	Bituminous Street - 4" (Access)	1,700 sq.yd.	\$ 50	\$ 85,000
	Bituminous Driveway - 2-1/2"	1,020 sq.yd.	\$ 30	\$ 30,600
	Concrete Driveway	500 sq.yd.	\$ 75	\$ 37,500
	Paver Driveway	100 sq.yd.	\$ 100	\$ 10,000
	Exposed Aggregate Concrete Driveway	30 sq.yd.	\$ 90	\$ 2,700
	Stamped Concrete Driveway	30 sq.yd.	\$ 100	\$ 3,000
	Gravel shoulders	170 sq.yd.	\$ 10	\$ 1,700
	Timber Border on Gravel Shoulder	45 lin.ft.	\$ 10	\$ 450
21.	<b>Driveway Borders:</b>			
	Exposed Aggregate	120 lin.ft.	\$ 25	\$ 3,000
	Paver or Brick	40 lin.ft.	\$ 30	\$ 1,200
	Concrete curb	40 lin.ft.	\$ 20	\$ 800
22.	<b>Driveway Culvert Headwalls</b>			
	Bituminous	4 each	\$ 500	\$ 2,000
	Concrete	4 each	\$ 1,000	\$ 4,000
	Railroad Tie or Landscaping Timbers	8 each	\$ 500	\$ 4,000
	Laid Stone with mortar	6 each	\$ 1,250	\$ 7,500
	Laid Stone	8 each	\$ 750	\$ 6,000
	Laid Block	4 each	\$ 750	\$ 3,000
	Garden/Gravel Restoration at Headwalls	9 each	\$ 250	\$ 2,250
23.	<b>Tree, Bush and Landscaping Replacement</b>			
	Spruce/Pine Trees	9 each	\$ 750	\$ 6,750
	Arbor Vitae	50 each	\$ 100	\$ 5,000
	Bushes	40 each	\$ 150	\$ 6,000
	Wood Fence	1 each	\$ 1,000	\$ 1,000
	Brck Yard Lights	4 each	\$ 750	\$ 3,000
24.	<b>Restoration of Lawns and Parkways</b>			
	Topsoil and Sod	1,210 lin.ft.	\$ 12	\$ 14,520
	Topsoil and Seed	8,060 lin.ft.	\$ 6	\$ 48,360
25.	<b>Preconstruction Video Recording</b>		Lump Sum	\$ 12,000
26.	<b>Traffic Control and Protection</b>		Lump Sum	\$ 20,000
27.	<b>Cash Allowance for Landscaping Contingencies</b>		Lump Sum	\$ 10,000
<b>OPINION OF PROBABLE TOTAL CONSTRUCTION COST</b>				<b>\$ 2,111,280</b>
				<b>Say: \$ 2,111,000</b>
<b>OPINION OF PROBABLE TOTAL REPAVING COST</b>				<b>\$ 150,000</b>
				<b>Say: \$ 150,000</b>

**St. Alphonsus Parish and School  
Prospect Heights, Illinois  
Water Main Extension**

**EXHIBIT 2**

**Opinion of Probable Construction Cost**

Item No.	Description	Quantity Unit	Unit Price	Amount
1.	Water Main (Open Cut)			
	12-inch	290 lin.ft.	\$ 65	\$ 18,850
	8-inch restrained joint	10 lin.ft.	\$ 55	\$ 550
2.	Water Main Fittings - Restrained Joint Type			
	12-inch x 8-inch Tee	1 each	\$ 650	\$ 650
	12-inch x 6-inch Tee	1 each	\$ 625	\$ 625
	12-inch Plug	1 each	\$ 500	\$ 500
	8-inch Plug	1 each	\$ 325	\$ 325
3.	Gate Valve and Valve Box			
	12-inch	2 each	\$ 1,500	\$ 3,000
	8-inch	1 each	\$ 1,200	\$ 1,200
4.	Fire Hydrant	1 each	\$ 4,000	\$ 4,000
5.	Sanitary Sewer Service Line Repair	1 each	\$ 200	\$ 200
6.	Replacement of Drain Tiles			
	6-inch	20 lin.ft.	\$ 20	\$ 400
7.	Backfilling with Granular Backfill Materials	80 lin.ft.	\$ 50	\$ 4,000
8.	Pavement Restoration			
	Bituminous Driveway - 3"	70 sq.yd.	\$ 32	\$ 2,240
9.	Restoration of Lawns and Parkways			
	Topsoil and Seed	220 lin.ft.	\$ 5	\$ 1,100
10.	Preconstruction Video Recording		Lump Sum	\$ 250
11.	Traffic Control and Protection		Lump Sum	\$ 500
<b>OPINION OF PROBABLE TOTAL CONSTRUCTION COST (IF CONSTRUCTED AS PART OF LAKE CLAIRE PROJECT)</b>				<b>\$ 38,390</b>
				<b>Say: \$ 38,000</b>

**St. Alphonsus Parish and School  
Prospect Heights, Illinois  
Water Main Extension**

**EXHIBIT 3**

**Opinion of Probable Construction Cost**

Item No.	Description	Quantity	Unit	Unit Price	Amount
1.	Water Main (Open Cut)				
	3-inch	290	lin.ft.	\$ 39	\$ 11,310
	3-inch restrained joint	10	lin.ft.	\$ 44	\$ 440
2.	Water Main Fittings - Restrained Joint Type				
	3-inch 90 degree bend	1	each	\$ 125	\$ 125
	12-inch x 6-inch Tee	0	each	\$ 625	\$ -
	12-inch x 3-inch reducer	1	each	\$ 250	\$ 250
3.	Gate Valve and Valve Box				
	3-inch	2	each	\$ 500	\$ 1,000
	8-inch	0	each	\$ 1,200	\$ -
4.	Fire Hydrant	0	each	\$ 4,000	\$ -
5.	Sanitary Sewer Service Line Repair	1	each	\$ 200	\$ 200
6.	Replacement of Drain Tiles				
	6-inch	20	lin.ft.	\$ 20	\$ 400
7.	Backfilling with Granular Backfill Materials	80	lin.ft.	\$ 50	\$ 4,000
8.	Pavement Restoration				
	Bituminous Driveway - 3"	70	sq.yd.	\$ 32	\$ 2,240
9.	Restoration of Lawns and Parkways				
	Topsoil and Seed	220	lin.ft.	\$ 5	\$ 1,100
10.	Preconstruction Video Recording			Lump Sum	\$ 250
11.	Traffic Control and Protection			Lump Sum	\$ 500
<b>OPINION OF PROBABLE TOTAL CONSTRUCTION COST (IF CONSTRUCTED AS PART OF LAKE CLAIRE PROJECT)</b>					<b>\$ 21,815</b>
<b>Say:</b>					<b>\$ 22,000</b>