

PRELIMINARY ENGINEERING REPORT


Sanitary Sewer and Watermain Improvements
Todd Township Annexation Area III

Park Rapids, Minnesota

November 2011

ULTEIG ENGINEERS, INC.
Consulting Municipal Engineers
Detroit Lakes, Minnesota

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By:  _____ Lic. No. 47561 11/22/2011
Jonathan S. Olson, P.E. _____ Date

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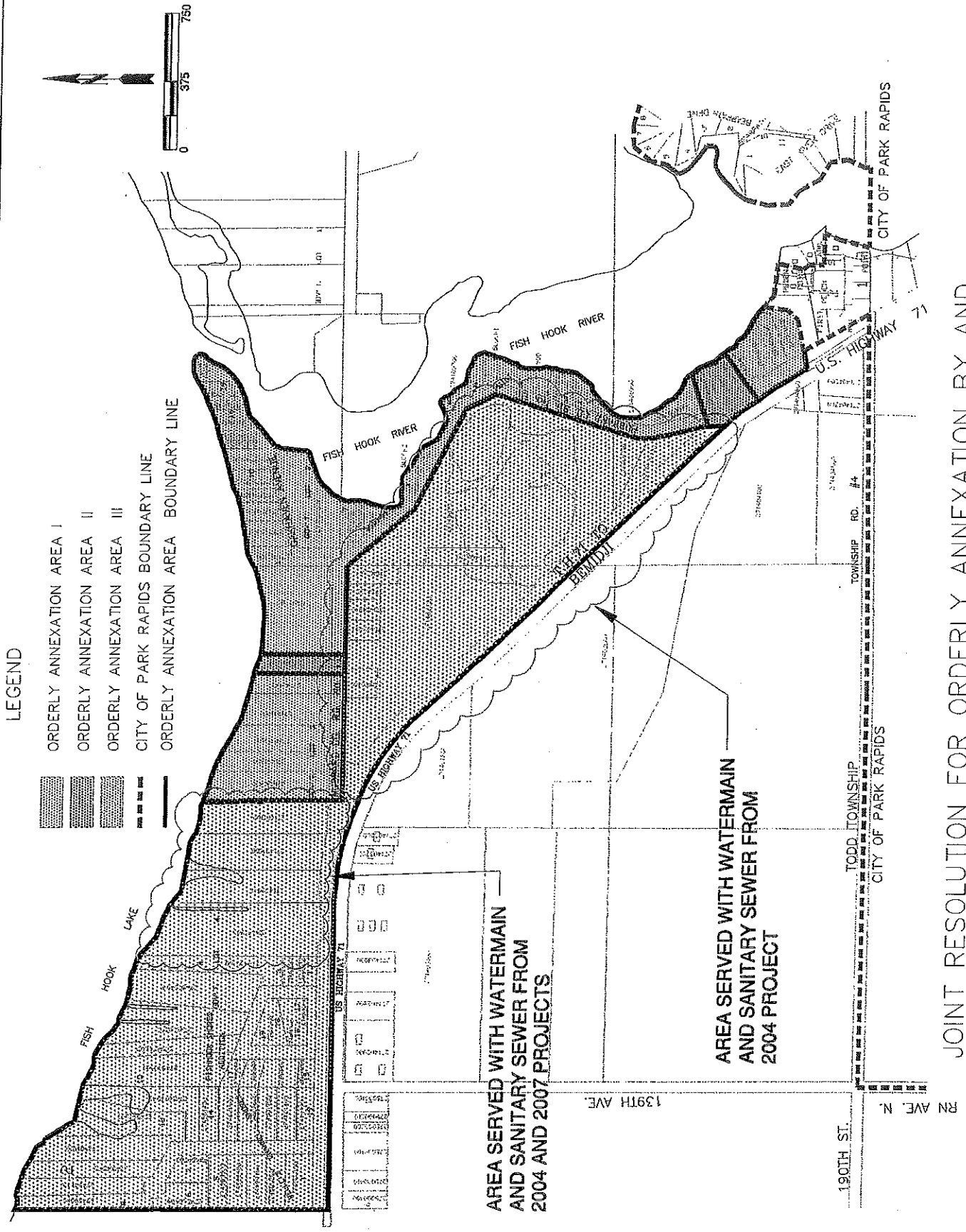
1. Introduction

A. Scope

This Preliminary Engineering Report has been prepared at the request of the City of Park Rapids to consider requirements for sanitary sewer and watermain improvements to serve properties that lie within the Todd Township and City of Park Rapids Orderly Annexation Agreement for Area III.

The scope of this study includes an evaluation of the requirements for extension of water and sanitary sewer facilities to these properties. The annexation area consists of approximately 104 acres. Approximately 60 of these acres were provided connection points to these facilities during the Dean Point project in 2004 and most recently a 500' extension project on US Highway 71 in 2007.

This study focuses on the extension of municipal water and sewer service to the Welle's Channel Shores and Fish Hook Park Addition portion of the Annexation Area III. A map of the Orderly Annexation is shown in Exhibit No. 1. The study also includes an examination of estimated project costs and estimated assessment that a parcel may receive. The proposed project location in relation to the City of Park Rapids is identified in Exhibit No. 2.



JOINT RESOLUTION FOR ORDERLY ANNEXATION BY AND BETWEEN TODD TOWNSHIP AND THE CITY OF PARK RAPIDS.

EXHIBIT No. 1
ANNEXATION AREAS
FISH HOOK RIVER / FISH HOOK LAKE
 Sanitary Sewer and Watermain Improvements
 Todd Township Annexation Area III

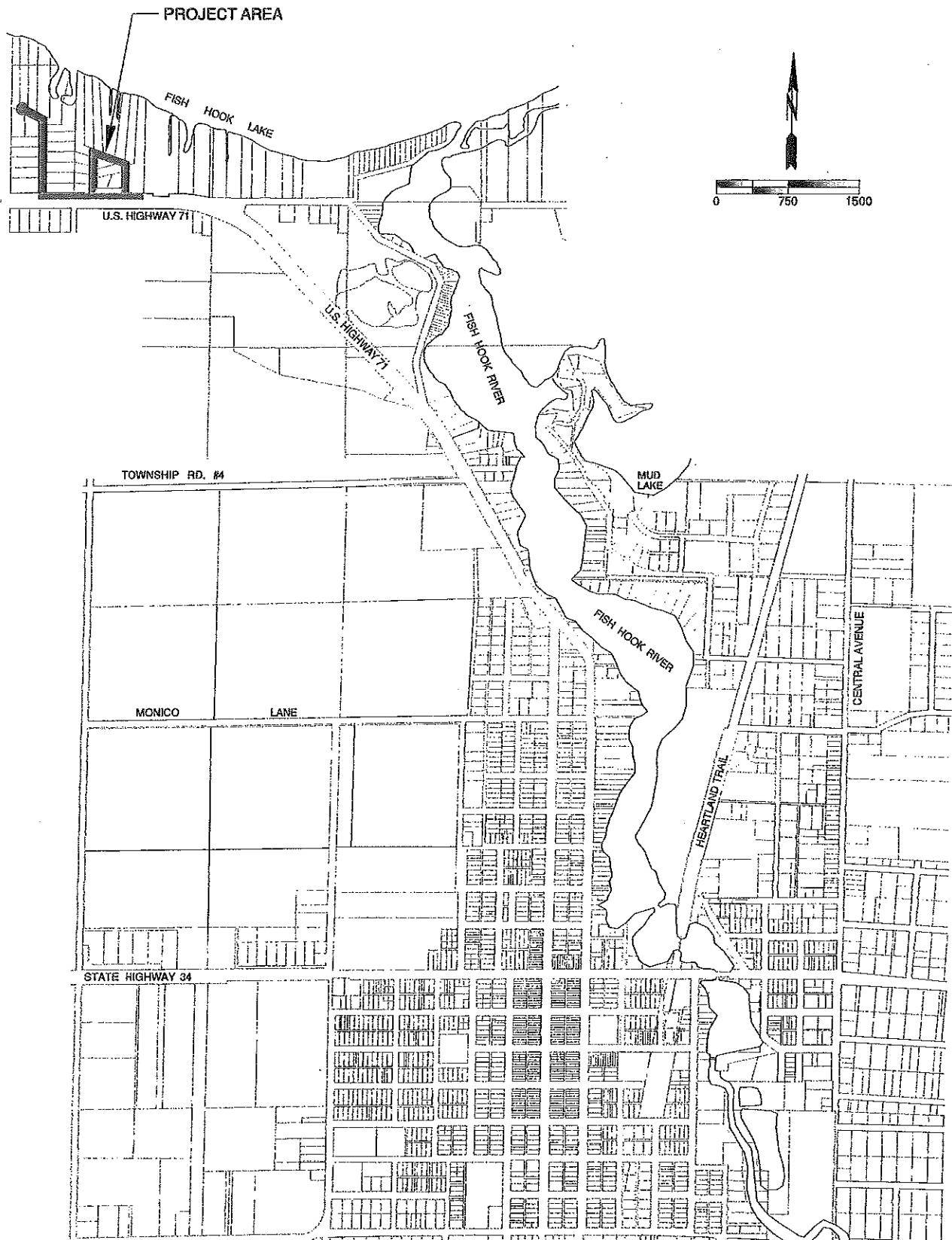


EXHIBIT No. 2
Location Map
Figure Name 2
 Sanitary Sewer and Watermain Improvements
 Todd Township Annexation Area III

B. Existing Site Conditions

The City of Park Rapids is located in northwestern Minnesota and is the County Seat for Hubbard County. The City is located at the junction of State Highway No. 34 and U.S. Highway No. 71.

The General Soils Map of Hubbard County classifies the soils as Bootlake-Graycalm Complex. These soils are described as well to excessively drained and are generally sloping sandy soils formed in outwash sands and gravels under mixed forest and prairie vegetation.

The area included for service in this project is approximately 44 acres and includes 32 parcels. The parcels consist of seasonal properties, permanent residences, or vacant platted lots.

2. Existing Water Supply and Wastewater Collection Facilities

This section provides information on the existing water supply and wastewater collection and treatment systems for the City of Park Rapids.

A. Water Production

The City of Park Rapids presently operates 3 wells, which supply all of the water for the municipal water system. These wells are currently operating at peak capacity to meet the City's needs. Improvements to the water supply system are currently being studied. The addition of new production wells within the City will likely be a result of this study. Improvements to the system are anticipated within the next year or two.

B. Water Treatment Plant

The City currently does not treat the water except for fluoridation and chlorine addition.

C. Elevated Storage Tank

The City has two (2) elevated storage facilities with a total capacity of 900,000 gallons.

D. Water Distribution System

The municipal water distribution system consists of 4 inch – 12 inch mains constructed of cast iron, ductile iron, and polyvinyl chloride (PVC) pipe. The connection point for the studied area is a 10 inch main on the north side of US Highway 71 at the east boundary of the Fish Hook Park Addition. This main was extended to this location in 2007.

E. Wastewater Treatment Plant

The wastewater treatment plant includes stabilization ponds and a land application system. The land application consists of spray irrigation on agricultural properties.

The treatment plant is permitted according to the National Pollutant Discharge Elimination System (NPDES) Permit for 452,000 gallons per day with a carbonaceous biochemical oxygen demand (CBOD₅) concentration of 260 milligrams per liter (mg/L).

Table 1: Monthly Wastewater Flows

Month	Flow (gal/day)
November 2010	259,000
December 2010	270,000
January 2011	270,000
February 2011	246,000
March 2011	285,000
April 2011	269,000
May 2011	275,000
June 2011	286,000
July 2011	298,000
August 2011	268,000
September 2011	247,000
October 2011	245,000
Average	268,000

The average flow for the last year was 268,000 gallons, which represents 59% percent of the current permitted capacity for flows.

F. Wastewater Collection System

The connection to the sanitary sewer system is in the same location as that of the watermain. The existing sanitary sewer is a 10 inch PVC main that has been design to receive flow from this area. The existing depth is insufficient to provide gravity service to the entire area.

Prior to expansion of the collection system, a permit must be approved by the Minnesota Pollution Control Agency (MPCA) that includes a review of the capacity of the treatment plant. If the facility continues to meet effluent standards, approval of the extensions is considered likely. The increase in flows will result in higher operational costs for pumping and treatment.

3. Design Considerations

A. Water Supply

The estimated water usage for the studied area is 9,600 gal/day. This is based upon an average of 100 gallons per capita per day usage and three people per parcel.

For residential development, the very minimum fire flow volume is 500 gpm with a residual pressure of 20 pounds per square inch (psi); 1,000 gpm is desirable. According to a water model conducted in 2004, the anticipated fire flows for this area range between 500 gallons per minute (gpm) to 1,000 gpm.

The increased water demands as a result of this expansion would not significantly impact the water capacity of the system. The studied area is nearing the end of the watermain expansion limits of the current water supply system, as the available fire flows are approaching the lower range of acceptable flows.

B. Wastewater Flows

The wastewater flows from the studied area are assumed to increase at the same rate as the water consumption increases; 9,600 gal/day. The existing treatment facility is adequately sized for this increase flow. Additionally, the CBOD₅ concentration for residential flow is assumed at 200 mg/L, which is below the permitted concentration levels.

C. Permit Requirements

Minimum standards for installation of sanitary sewer facilities must comply with the MPCA standards, for which a permit must be obtained. Approval of water distribution piping and facilities will require Minnesota Department of Health (MDH) approval. The Minnesota Department of Transportation

(MnDOT) will require a permit for work within U.S. Highway No. 71 right-of-way.

D. Soil Borings

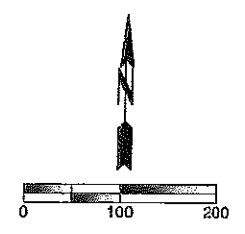
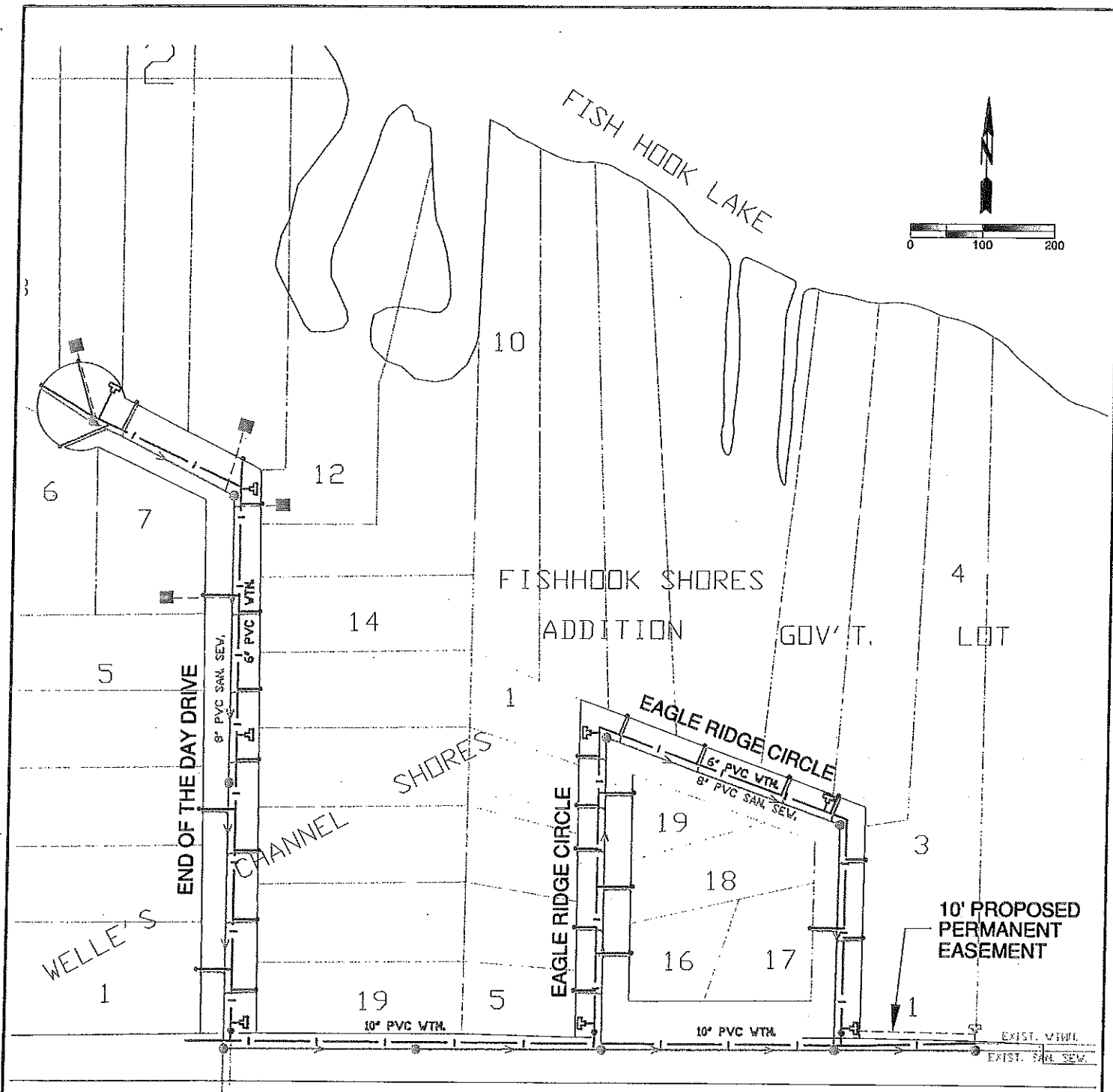
The Park Rapids area has predominately sandy soil conditions; however, in the low lying areas, there may be soils that are unsuitable for road fill. Additionally, high groundwater levels are expected. Soil borings should be completed during the design phase to verify that all subgrade soils are suitable for road construction and to verify any dewatering requirements for underground utility installation.

4. Description of Improvements

A. Watermain

The existing 10 inch PVC watermain within the north ditch of US Highway 71 would be extended westerly. 6 inch PVC mains would be extended from this trunkline into the developments of Welle's Channel Shores and Fish Hook Park Addition. The watermain improvements would include hydrants, PVC mainline pipe, ductile iron fittings, service laterals, hydrants, and gate valves.

Watermain services would be installed from the main to the property line at locations where immediate service to buildings or residences is required. Services would also be installed to the property line for vacant lots and future building sites. Service requirements to these vacant parcels would be determined during the design phase. Water service connections from the property line to the building would be completed privately by the property owner following the improvements discussed in this study. The proposed watermain distribution system is presented in Exhibit No. 3.



T.H. 71

FUTURE WATERMAIN AND SANITARY SEWER

PROPOSED LEGEND

- WATERMAIN
- WATER HYDRANT
- GATE VALVE
- SANITARY SEWER
- SANITARY MANHOLE
- GRINDER LIFT STATION AND FORCEMAIN

EXHIBIT No. 3
Proposed Watermain & Sanitary Sewer Improvements
 Sanitary Sewer and Watermain Improvements
 Todd Township Annexation Area III

B. Sanitary Sewer

The existing system 10 inch PVC trunkline on US Highway 71 would be extended within the north ditch of TH 71. 8 inch PVC mains would be installed from this extended trunkline underneath End of the Day Drive and Eagle Ridge Circle.

Services will be installed to the property line location. Service locations will be determined during the design phase. The connection from the property line to the building will be the property owner's responsibility, and this would not be included in the City project.

There are a few of the properties that lie at a lower elevation than the available sewer depth. A lift station and forcemain piping was evaluated for this reason. The estimated cost for a lift station and forcemain piping is \$130,000. The service area would be limited to the few homes within Welle's Channel Shores Development. For these two reasons, this was ruled out as a feasible option. It is recommended that service to these lower properties be provided with individual grinder pumping stations that would be installed at each of these properties to pump sewage from the home to the main. These pumping units would be installed as part of the improvement project however would be the property owner's responsibility to operate and maintain. Easements from each property would be required for the installation of these units. The final determination for service to these properties will be during the design phase resulting from the availability of easements and other cost considerations.

C. Street and Turf Restoration

Open excavation will be required for the utility installation resulting in the removal of the existing gravel streets. The existing gravel streets would be reconstructed to a 30' width and surfaced with bituminous to minimize

future maintenance efforts. Ditches would be constructed on both sides to collect and convey stormwater to suitable discharge points. .

The project would not require any stormwater treatment regulations, however, the ditch sections will be sized to ensure runoff discharge rates are equal to or less than proposed conditions. The proposed street improvements are shown in Exhibit No. 4.

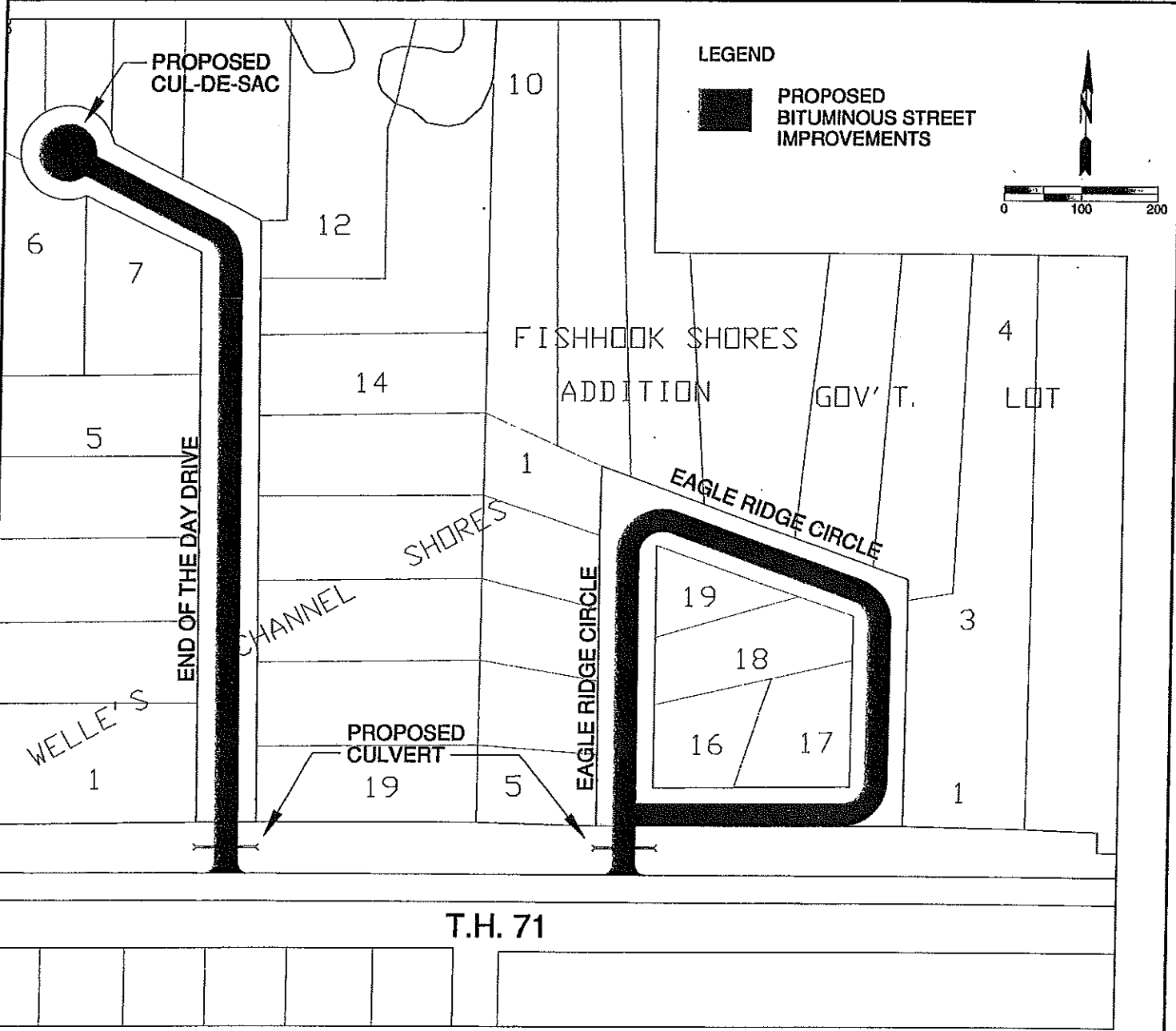
D. Easements

The existing right-of-way within the studied area is sufficient for the installation of water and sanitary sewer with exception of at the TH 71 connection point to the existing facilities and at the individual private lift station locations.

At the connection point of the existing facilities, a ten (10) foot permanent easement will be required along the southern property line of Lot 1 of the Fish Hook Park Addition. The necessary easements for the private lift stations would be determined during the design phase.

Temporary construction easements may be required for construction purposes in various locations throughout the project. Any need for temporary easements would be determined during the design phase.

No costs are included in this report for easement acquisition.



TYPICAL SECTION

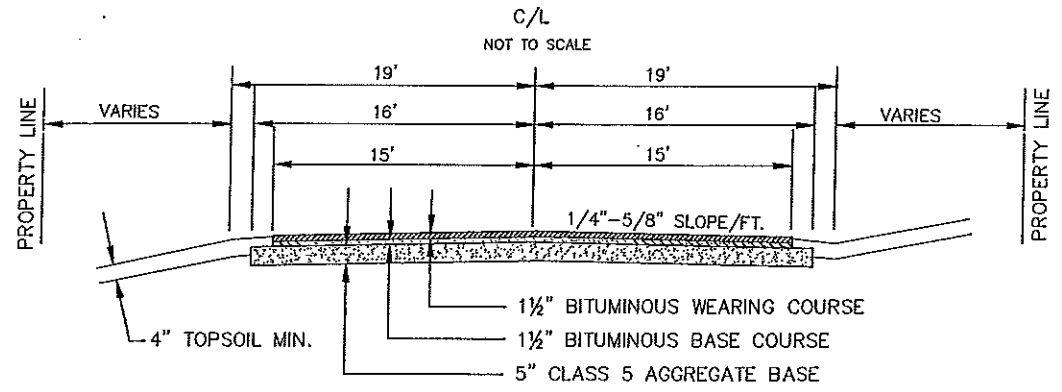


EXHIBIT No. 4
STREET IMPROVEMENTS &
PROPOSED TYPICAL STREET SECTION
 Sanitary Sewer and Watermain Improvements
 Todd Township Annexation Area III

5. Estimate of Costs

The estimated cost for the proposed improvements includes estimated construction costs and engineering fees. This estimate does not include costs for easement acquisition, permit fees, soil borings, financing fees, or other items not specifically covered in this report that may be identified during the design phase.

Table No. 2 indicates the estimated costs for the proposed improvements that are outlined in this report:

Table No. 2 – Estimated Project Costs

Description	Estimated Costs
Watermain	212,300
Sanitary Sewer	204,000
Water Service	57,800
Sewer Service	49,100
Street	314,100
Total	\$837,300

The estimate was based on current material prices and construction costs. The estimate would be updated following the completion of the design.

6. Estimated Assessments

The project would be financed through General City Funds and Special Assessments.

A. Summary of City's Special Assessment Policy

A summary of the City's Assessment Policy, as it would apply to this project, is stated below:

- Eight (8) inch sanitary sewer and 6 inch watermain are assessed 100 percent to the adjacent properties by the lineal foot. All costs for oversizing and looping are 100% City cost.
- Corner lots are assessed for sanitary sewer and watermain based upon the "short side" only.
- Water and sewer service laterals are assessed 100 percent for each type of service installed.
- Streets are assessed 60 percent to benefiting properties by the lineal foot.
- Corner lots are assessed for street and sidewalk based upon the "short side" and 50 percent of the "long side" up to 150 feet and 100 percent of the side lot beyond 150 feet.

B. Summary of Estimated Assessments

Based on the City's Assessment Policy as outlined above, Table No. 3 indicates the distribution of project costs and related estimated assessments.

Table No. 3 – Estimated Assessments

	City Share	Assessable Share	Unit	Rate
Watermain	53,100	159,200	LF	\$45
Sanitary Sewer	44,900	159,100	LF	\$44
Water Service	-	57,800	Each	\$1,750
Sewer Service	-	49,100	Each	\$1,500
Street	125,600	188,500	LF	\$47
Total	223,600	613,700		

The estimated assessment for an average 100' interior lot is \$17,000.

7. Conclusions

The proposed improvements are necessary to provide water and sanitary sewer service to Welle's Channel Shores and Fish Hook Park Additions. The City should establish a schedule for these improvements in accordance with the Orderly Annexation Agreement.

Respectfully submitted,

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Detroit Lakes, Minnesota