

East Side Water & Sanitary Sewer Serviceability Feasibility Study

Prepared For The

VILLAGE OF HORTONVILLE

Outagamie County, Wisconsin



Prepared By
McMAHON | Neenah, Wisconsin

March 16, 2018
H0004-9-18-00257.00

TECHNICAL MEMORANDUM

I. BACKGROUND

STH '15', which currently runs through the Village of Hortonville, is scheduled to be rerouted to the north of the Village. The Village has been contacted about the possibility of a large commercial development at the new roundabout to be located near the intersection of STH '15' and West Broadway Drive (CTH 'JJ'). The development area is illustrated on Figure #1. The proposed development is located approximately two-thirds of a mile east of the limits of the existing Village water and sewer system. The ground elevation at the development site is approximately 60-feet higher than the ground elevation at the east end of the existing water and sewer system.

II. SERVICE FEASIBILITY

A. Water Use/Sanitary Sewer Discharge

The Developer operates a similar facility to the one being proposed in Hortonville in another community. Metered water use for the existing facility was provided for use in this analysis. Based on that data, it is projected the facility in Hortonville will use approximately 2,600 to 3,700 gpd of water and discharge a similar amount to the sanitary sewer system. This quantity of use approximates the use in ten (10) residential homes, combined, and will not have a significant impact on either the water or sanitary sewer systems.

B. Water System Service

The pressure in a water system is dependent on the height of water in the system's elevated tank and the ground elevation. As the ground elevation rises, the system pressure decreases. System pressure requirements are established in the Wisconsin Administrative Code by both the Public Service Commission (PSC) and the Department of Natural Resources (DNR). The system pressure shall be at least 35 psi at ground level in the distribution system. The Code requirements for both agencies are as follows:

TECHNICAL MEMORANDUM

PSC 185.82 Pressure Standards.

(1) Under conditions of normal heavy system demand, the residual pressure at the meter outlet shall not be less than 20 psig. For typical residential customers, normal conditions of use shall mean a flow rate of not less than 12-gallons/minute. This standard assumes that the customer's portion of the service lateral is of normal, adequate design, and in good condition. This standard shall ordinarily require the distribution main pressure at the corporation stop connection be at least 35 psig. The Utility is to establish minimum specifications for the service lateral to assure that excessive pressure drop does not occur in the lateral because of its length or for other cause.

NR 811.70 Water Main Design. The design of water mains and distribution systems shall meet the following requirements:

(4) PRESSURE. All water mains, including those not designed to provide fire protection, shall be sized after a hydraulic analysis based on flow demands and pressure requirements. The minimum and maximum normal static pressure in the distribution system shall be 35 psi and 100 psi, respectively, at ground level. The system shall be designed and operated to maintain a minimum residual pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow.

An analysis of the available pressure that could be provided at the proposed development indicates that 35 psi can be provided at the far northwest corner of the development. This is illustrated on Figure #1. Based on a water elevation of 955 in the elevated tank (maximum elevation is 965), the service limit for the existing Hortonville water system is an elevation of 874. The proposed development would need to install a small pressure Booster Pump Station, at their cost, to provide acceptable service at the site of the structure building.

In the future, a separate pressure zone would need to be developed if there is a desire to extend the water system east of the 874 elevation contour shown on Figure #1. Development of a separate pressure zone is a complex (and costly) undertaking; requiring a Pump Station and storage facilities, depending on the extent of the service area.

Another critical component of a municipal water system is the capability to provide an adequate quantity of water for fire protection. DNR Code requirements for fire protection are as follows:

NR 811.70 Water Main Design. The design of water mains and distribution systems shall meet the following requirements:

(6) FIRE PROTECTION. The minimum flow requirement for water mains serving fire hydrants is 500 gpm at 20 psi residual pressure at ground level at all points in the distribution system.

The results of a field fire flow test conducted at the far east end of the existing distribution system were used to project the available fire flow capacity at the proposed development. It was assumed that a 12-inch water main would be extended from the existing system to the development. The results of the fire flow analysis are as follows:

Field Fire Flow Test East End Of Existing System
(approximately 700-feet west of Greendale Road)

- Static Pressure - 63 psi
- Available Fire Flow at 20 psi - 3,100 gpm

Projected Available Fire Flow At Northwest Corner Of Proposed Development

- Static Pressure - 37 psi
- Available Fire Flow at 20 psi - 1,240 gpm

The existing water system can be extended to provide marginal service to the proposed development. The water system pressure at the new property would be at the minimum allowable level of 35 psi. Adequate fire flow can be provided if a 12-inch main is extended to the site, as illustrated on Figure #1.

C. Sanitary Sewer Service

The topography of the proposed development is well suited for extending gravity sewer service to the development. An 8-inch sewer main, constructed at a depth of approximately 8-feet, can be extended with acceptable slopes. The layout of the proposed sewer main is shown on Figure #1. Sewer service could easily be extended to serve additional properties in the area.

III. OPINION OF PROBABLE COST

An Opinion Of Probable Cost⁽¹⁾ has been developed for the extension of water and sanitary sewer service to the proposed development. The preliminary layout for the utilities is illustrated on Figure #1, and the cost is presented in Table #1.

IV. CONCLUSION

A Developer has proposed a large commercial development consisting of a single facility at the intersection of STH '15' and Broadway Drive. STH '15' is scheduled to be re-routed around the Village of Hortonville and a roundabout is planned at this location. An analysis has been conducted to evaluate the feasibility of extending Village water and sanitary service to the proposed development. The site location and potential utility extensions are shown on Figure #1.

Based on water usage information from an existing similar development, it is anticipated the facility will use approximately 2,600 to 2,700 gpd. This relatively low quantity of flow will not impact the capacity of the Village water or sanitary sewer system.

Wisconsin Administrative Code NR 811 establishes that a minimum pressure of 35 psi be provided by the water system. Based on the hydraulic grade line of the system, service cannot be extended from the existing system at elevations higher than 874. As illustrated on Figure#1, water service can be extended to the far northwest corner of the property and provide 35 psi. The property owner would need to install a Booster Pump System to provide acceptable pressure on the site. Adequate fire protection can be provided at the northwest corner of the site with the extension of a 12-inch water main from the existing system.

Extending gravity sanitary sewer service to the site is relatively simple. Due to the topography of the area, a sewer main can be constructed at a depth of approximately 8-feet with acceptable pipe slopes.

The Opinion Of Probable Cost⁽¹⁾ to extend water and sanitary sewer service to the development is approximately \$633,000, as detailed in Table #1.

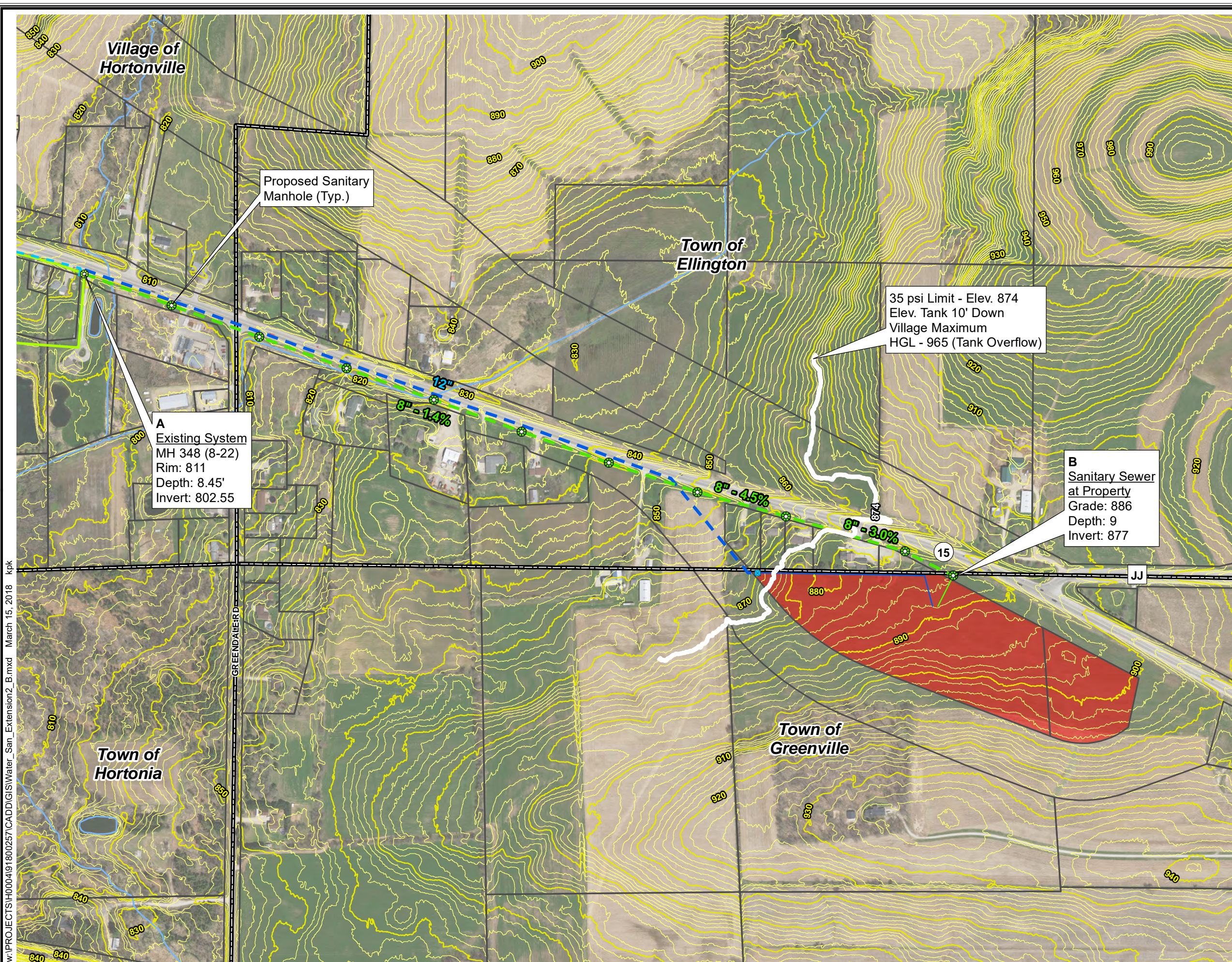
Prior to further analysis or agreements with the Village, the property Developer should confer with the Plumbing and Fire Protection Designers to determine if the water facilities that could be provided to the corner of the site will be suitable for their use in the project.

**Table #1 - East Side Water & Sanitary Sewer Extension
VILLAGE OF HORTONVILLE**

Item	Qty	Unit	Description	Unit Price	Total
1	1	L.S.	Connection To Existing Water Main	\$2,500.00	\$2,500
2	3,265	L.F.	12-Inch Water Main	\$52.00	\$169,780
3	6	EA	12-Inch Water Gate Valve	\$4,250.00	\$25,500
4	7	EA	Hydrant, Including valve and connecting pipe	\$6,000.00	\$42,000
5	1	EA	2-Inch Service, including service box and shutoff valve	\$1,500.00	\$1,500
6	1	EA	6-Inch Fire Service And 6-Inch Gate Valve	\$2,800.00	\$2,800
7	1	L.S.	Connection To Existing Sanitary Sewer Main	\$1,000.00	\$1,000
8	3,965	L.F.	8-Inch Sanitary Sewer	\$45.00	\$178,425
9	10	EA	Sanitary Manhole	\$2,500.00	\$25,000
10	1	EA	4-Inch Sanitary Lateral	\$1,000.00	\$1,000
11	1	L.S.	Traffic Control	\$7,500.00	\$7,500
12	1	L.S.	Pavement Restoration	\$12,000.00	\$12,000
13	12,000	S.Y.	Lawn & Turf Restoration	\$1.50	\$18,000
Sub-Total Water & Sanitary Sewer Extension					\$487,005
Contingencies, Administration & Engineering (30%)					\$146,200
Total					\$633,205

Water and sanitary sewer laterals and Booster Pump Station on private property not included.

⁽¹⁾ **Disclaimer:** The attached Opinion Of Probable Cost was prepared for use by the Owner in planning for future costs of the project. In providing Opinions Of Probable Cost, the Owner understands that the Design Professional has no control over costs or the price of labor, equipment or materials, or over Construction Professionals' method of pricing, and that the Opinions Of Probable Cost provided herewith are made on the basis of the Design Professional's qualifications and experience. It is not intended to reflect actual costs, and is subject to change with the normal rise and fall of the local area's economy. This Opinion must be revised after every change made to the project or after every 30-day lapse in time from the original submittal by the Design Professional.



Mapped Features

- Proposed Watermain
- Proposed Gravity Sanitary Main and Manhole
- Proposed Water Lateral
- Proposed Sanitary Lateral
- x Proposed Water Booster Pump Station
- - - Existing Watermain
- x Existing Gravity Sanitary Main and Manhole
- Initial Development Area
- Municipal Boundary
- Parcel Line
- 874 Contour 874
- 970 Index Contour (10 ft.)
- 970 Intermediate Contour (2 ft.)
- ~ Stream

Proposed Sanitary Manhole (Typ.)

A
Existing System
MH 348 (8-22)
Rim: 811
Depth: 8.45'
Invert: 802.55

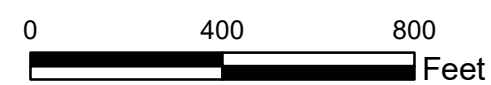
35 psi Limit - Elev. 874
Elev. Tank 10' Down
Village Maximum
HGL - 965 (Tank Overflow)

B
Sanitary Sewer
at Property
Grade: 886
Depth: 9
Invert: 877

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Source: Outagamie County, 2014-18.

Disclaimer: The property lines, right-of-way lines, and other property information on this drawing were developed or obtained as part of the County Geographic Information System or through the County property tax mapping function. McMAHON ASSOCIATES, INC. does not guarantee this information to be correct, current, or complete. The property and right-of-way information are only intended for use as a general reference and are not intended or suitable for site-specific uses. Any use to the contrary of the above stated uses is the responsibility of the user and such use is at the user's own risk.



McMAHON
ENGINEERS ARCHITECTS
McMAHON ASSOCIATES, INC.

FIGURE 1
POTENTIAL UTILITY EXTENSION
VILLAGE OF HORTONVILLE
OUTAGAMIE COUNTY, WISCONSIN