



**BOLTON
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Feasibility Report for

Cherrywood Addition Public Storm Water Improvements City of Worthington, MN

June 2020

BMI Project Number F18.121544

Submitted by:

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Certification

Feasibility Report

For

Cherrywood Addition
Public Storm Water Improvements

City of Worthington
Worthington, MN

F18.121544

June 2020

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

By: Travis L. Winter
Travis L. Winter, P.E.
License No. 46649

Date: June 20, 2020

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I. INTRODUCTION AND BACKGROUND

The purpose of this report is to determine the feasibility of installing stormwater infrastructure on the Cherrywood Addition plat, or parts thereof, by extension of the municipal storm water collection and management system.

A petition was received by the City from the owners of over 35% of the property within the drainage area of the improvement being petitioned for. Per State Statutes, this initiates the process to consider ordering an improvement. The petition was received and this report has been prepared pursuant to a council resolution of June 8, 2020.

Cherrywood Addition is a residential type subdivision east of South Crailsheim Road (CSAH 10) and south of the Olson Park area. The plat consists of 7.83 acres divided into eight residential building lots, most of which will contain two- or three-unit buildings. An outlier has been platted to provide for the placement of the storm water basin. Various other easements are in place for the anticipated storm sewer extensions where construction is not on the street right-of-way.

Because there is other vacant property near the Cherrywood Addition that is available for future development, this report deals with land other than the immediate Cherrywood Addition parcel. In the subject of storm water collection and management, the area for possible future improvement that was examined stretched southward to First Avenue Southwest. Since there are no specific details for the future development of these adjacent areas, the proposed improvement was designed so that future extensions would be available to the extent possible. Additional properties may be subject to special assessments due to their location in relation to the proposed improvement necessary for future development.

Maps showing the proposed improvement and proposed assessment area is attached in the appendix.

II. PROJECT NEED

Cherrywood Addition is built in an area which has no existing storm sewers or water quality management features. The wet sedimentation basin and storm sewer that are existing on Dayton Drive, located west of South Crailsheim Road, have no relation to the subdivision area.

Currently, storm runoff flow is overland in a generally northward direction from First Avenue Southwest to Olson Park. Overland flow continues utilizing the South Crailsheim Road ditches and swales within Olson Park to move the storm water to Sunset Bay. There are some tile lines in the Olson Park area, but these are too small to be of any benefit for the Cherrywood Addition.

Drainage runoff from portions of the area south of the Cherrywood Addition and north of First Avenue Southwest flow directly north into the subdivision. This is accomplished by means of a culvert under the existing house driveway along the south edge of the subdivision. This culvert and driveway are on the property located to the south. The land to the south is currently being farmed but has the potential for, and is being marketed for, residential or similar development.

The areas contributing runoff to the wet sedimentation basin are:

Cherrywood Addition	=	4.81 acres
Between Cherrywood and First Avenue SW	=	<u>5.07 acres</u>
Total =		<u>9.88 acres</u>

The Minnesota Pollution Control Agency (MPCA) administers the Construction Stormwater General Permit program. Along with erosion and sediment control, this permit requires permanent storm water management when a project creates more than one acre of new impervious surface. A bioretention basin will be needed to comply with this permit. This will also satisfy the requirements of the Okabena-Ocheda Watershed District and the City of Worthington.

The City of Worthington, as a Municipal Separate Storm Sewer System (MS4), has adopted storm water requirements that follow the State of Minnesota's Minimal Impact Design Standards (MIDS). The runoff volume requirement to be retained on site is 1.1 inches of runoff from all impervious surfaces on the site. This site lies within the City's Drinking Water Supply Management Area (DWSMA), which has a high vulnerability rating for pollutants reaching the ground water table. Also, the soils in the project area consist of Type C/D soils, which are not conducive for infiltration. Thus, the permit prohibits infiltration of storm water runoff in these instances.

MIDS allows for Flexible Treatment Options (FTO) to be used if varying soil conditions and other constraints across the site prohibit infiltration. For this site, FTO #2 will be used to meet the volume control requirement to the maximum extent possible. The goal of this option is to remove 60% of the annual TP load from the increase in impervious surfaces if the site is new development.

As part of the preliminary plat process for Cherrywood Addition a wet sedimentation pond was originally proposed for this site. Since the time of the Cherrywood Addition plat being approved, the stormwater requirements have changed. Due to the change in storm water requirements, a bioretention basin is planned to be constructed to satisfy the rate and water quality requirements. The basin will have an underdrain tile that will extend along the east side ditch of South Crailsheim Road to the north approximately 240-ft and connect into an existing 10-inch concrete

tile that drains to Sunset Bay.

Outlot A was created at the northwest corner of the plat to provide a location for the basin. This 0.43-acre area will become City property and will be maintained by the City. A storm sewer system is also anticipated as being needed for the project. A storm sewer pipe system will be needed extending south from the basin to Cherrywood Lane, then east on the new street to the cul-de-sac area. The storm sewer pipe will then extend south to the edge of the plat near the existing driveway culvert. At this location, a storm inlet and minor grading will capture overland flow from south of the Cherrywood Addition. It is anticipated that this storm sewer will be extended toward First Avenue Southwest when that property is further developed.

The storm sewer system should be designed to contain the runoff from a five-year storm event within the piping system. Swales for overland flows which exceed this capacity are to be incorporated into the final grading of the subdivision. These minor swales would follow the route of the storm sewer pipe. Easements were created for the pipe and swales as part of the platting process.

Figure B shows the contributing drainage areas that flow to the regional pond. The future development area south of the Cherrywood Addition was assumed to consist of residential land use with a runoff Curve Number of 81 and thirty percent (30%) impervious area. The water quality volume for this future development was also included in the design of the regional pond.

III. CITY PROJECT AND DEVELOPER PROJECT SCOPE

As areas outside of the subdivision plat also contribute runoff water to the proposed bioretention basin and storm sewer piping, this improvement will need to be a City project and not developer installed.

The area contributing to the storm water system includes all or portions of that part of the south 950 feet of the southeast quarter of Section 28, Township 102 North, Range 40 West lying east of South Crailsheim Road.

The City installed storm sewer on Cherrywood Lane will provide the main piping system for street drainage. Appropriate catch basins and connecting leads to the main pipe will be installed by the developer as part of the street construction.

IV. PROJECT COST AND FINANCING

ESTIMATED IMPROVEMENT COSTS

STORM WATER COLLECTION AND MANAGEMENT

Filtration basin	\$164,100
Storm sewer	\$60,600
Total	\$224,700

*The estimated costs of the project include engineering and contingencies.

Areas outside of the subdivision plat also contribute runoff water to the proposed bioretention basin and storm sewer piping additional properties are subject to storm water assessments.

Special assessments for the improvement are to be levied in accordance with the City's Assessment Ordinance. Applicable provisions of the Assessment Ordinance are:

1. Project costs are to be assessed to the properties within the drainage district including those of the City. The City can only levy current assessments to those properties within the corporate limits.
2. The assessment rate is to be the project cost divided by the adjusted drainage area provided such a rate does not exceed a storm sewer assessment limit defined by a 1975 base rate of \$0.03 per square foot as brought forward to current value by use of a Construction Cost (ENR) Index. The base assessment rate limit projected to be applicable for this project is estimated at \$0.155 / square foot.
3. The factors for adjusting the area of various parcels of land in determining the base rate and correspondingly used in determining the assessment rate for a given parcel are based on land use or potential land use. These factors are 0.75 for Open Space, 1.0 for Residential, 1.25 for Multi Family and Institutional, and 1.5 for Commercial. The assessment limit is proportional to these factors.
4. The residential rate (land use factor of 1) will be applicable to all areas within the subdivision except the Pond site. Retention/ponding sites are part of the storm water management system rather than its drainage area and therefore should not be considered as rate determining or assessable areas.

The cost of the improvement divided by the rate determining area (\$0.5102) exceeds the assessment limit, the assessment limit will establish the assessment rate for the improvement.

The following table outlines storm water project costs and assessments:

CITY SHARE:

Above assessment limit and rounding =	\$145,070
Public Right-of-way (Cherrywood Lane) =	\$18,338
	<hr/>
TOTAL CITY SHARE =	\$163,408 (72.7%)
ASSESSMENTS RECEIVABLE =	<u>\$61,292 (27.3%)</u>
TOTAL STORM WATER PROJECT =	\$224,700

V. CONCLUSIONS

From an engineering standpoint, this project, as proposed, is feasible, cost effective and necessary for the development of the Cherrywood Addition in the City of Worthington. The proposed storm water improvements described in this report can best be accomplished by requesting competitive bids for the project. It is recommended that the storm sewer improvements be bid and completed in 2020, as requested by the developer.

These preliminary estimated costs have been prepared based on current, average bidding prices and are subject to variation due to construction timing, contractor workloads, etc. The cost estimates include the estimated cost of engineering and contract administration, but do not include the cost of any fiscal fees related to the project financing.

Appendix A: Preliminary Cost Estimate



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ENGINEER'S PRELIMINARY COST ESTIMATE

CHERRYWOOD ADDITION STORM WATER

City of Worthington

BMI Project No.: F18.121544

H:\WGTON\F18121544\2_Preliminary\A_Calculations\[2020-06-23 121544 Prelim Cost Est.xlsx]Prelim Cost Estimate

June 25, 2020

No.	Item	Unit	Unit Price	Total Quantity	Total Cost
1	MOBILIZATION	LS	\$12,000.00	1.00	\$12,000.00
2	TRAFFIC CONTROL	LS	\$5,000.00	1.00	\$5,000.00
3	COMMON EXCAVATION (EV) (P)	CY	\$10.00	1,600	\$16,000.00
4	BIORETENTION BASIN (IRON ENHANCED SAND FILTER)	LS	\$70,000.00	1	\$70,000.00
5	6" PERFORATED HDPE DRAIN TILE	LF	\$5.00	550	\$2,750.00
6	6" SOLID WALL HDPE DRAIN TILE	LF	\$5.00	290	\$1,450.00
7	48" DIAMETER WATER QUALITY STRUCTURE	EACH	\$5,000.00	1	\$5,000.00
8	CONNECT TO EXISTING DRAINTILE/STRUCTURE	EACH	\$1,000.00	1	\$1,000.00
9	EROSION CONTROL BLANKET	SY	\$5.00	1,700	\$8,500.00
10	SILT FENCE	LF	\$3.00	400	\$1,200.00
11	SEEDING	SY	\$3.00	1,700	\$5,100.00
12	24" RCP STORM PIPE	LF	\$35.00	490	\$17,150.00
13	48" STRUCTURE	EACH	\$4,200.00	1	\$4,200.00
14	60" STRUCTURE	LF	\$550.00	16	\$8,525.00
15	24" RCP FES	EACH	\$1,800.00	1	\$1,800.00
16	CLASS 3 RIPRAP	CY	\$100.00	15	\$1,500.00
17	MISCELLANEOUS CONSTRUCTION ITEMS	LS	\$9,000.00	1	\$9,000.00
Subtotal					\$170,200.00
10% Contingency					\$17,000.00
Total Estimated Construction Cost					\$187,200.00
Design, Administration and Construction Engineering					\$37,500.00
Total Estimated Project Cost					\$224,700.00

Appendix B: Figures





