MINNEHAHA CREEK WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

Meeting: Board of Managers
Meeting date: 12/1/2022
Agenda Item #: 11.2
Item type: Action

Title:	Ordering Lamplighter Pond Water Quality Project and Approving Project Agreement with City of St. Louis Park
Prepared by:	Name: Kayla Westerlund Phone: 952-473-2855 kwesterlund@minnehahacreek.org
Reviewed by:	Chuck Holtman, District Attorney
Recommended action:	Ordering of the Lamplighter Pond Water Quality Project
Past Board action:	August 20, 2018: Res #18-083 Variance Approval for LifeTime, Inc., 5525 Cedar Lake Road, Permit 18-153 December 16, 2021: Res #21-089 Authorization to Execute a Contract with Stantec, to develop a Feasibility Study of a Filtration System at Lamplighter Pond October 20, 2022: Public Hearing for the Lamplighter Pond Water Quality Project

Summary:
Background
The Board of Managers approved a request for a variance from Minnehaha Creek Watershed District's Stormwater Management rule for Permit #18-153 on August 23, 2018. Healthy Way of Life I, LLC ("Applicant") requested the variance to address the infeasibility of meeting stormwater management requirements on site. As a condition of the variance, the District and Applicant executed a cooperative agreement (District-Lifetime agreement) to fund a regional stormwater management project to provide an equivalent amount of stormwater treatment to what would have been required on-site. The Applicant agreed to place $490,000 in an escrow held by the District. The District may apply the escrowed funds to the costs of identifying, designing, constructing and maintaining an alternative stormwater treatment facility. Pursuant to the terms of the Agreement, the District must take formal action identifying one or more projects for final feasibility and advancement of design by August 23, 2023.

To advance the District-Lifetime agreement, on December 16, 2021 the Board authorized a contract with Stantec to perform a feasibility study of a manufactured treatment device (MTD). The feasibility study was completed in August 2022. District staff and the District Engineer reviewed the feasibility study with City of St. Louis Park staff, and collectively have recommended the MTD be constructed at Northside Park, 2200 Louisiana Ave S, St Louis Park, MN 55426 in the eastern boulevard to Nevada Avenue adjacent to the Northside Park parking lot. The project consists of pumping water through a Contech StormFilter (CSF), from where it will drain via gravity downstream to Lamplighter Pond, ultimately making its way to Twin Lake. The CSF unit is an underground concrete rectangular vault that uses 27" PhosphoSorb media cartridges for filtration. Maintenance consists principally of cartridge replacement about every 1-3 years. The project would remove 7.2 lbs/year of phosphorus, thus meeting the terms of the District-Lifetime agreement. The estimated construction cost for the project is $289,000. The project would be funded from escrow supplied by the Applicant under Permit #18-153 to provide for off-site treatment of stormwater.

District staff have proposed, and City staff have concurred, that the City perform the MTD installation and assume responsibility for operation and maintenance. On September 30, 2022, the District administrator transmitted a cooperative agreement (District-City agreement) to the City outlining the roles and responsibilities of the City and District in advancing the project. The District-City agreement reflects that the City would be responsible for project

design, construction, and maintenance, in coordination with the District. The City may invoice the District from time to time for design and construction costs incurred, and the District will disburse escrow funds in reimbursement. Remaining escrow funds up to the present value of the maintenance commitment also would be paid over to the City to fund ongoing maintenance.

In accordance with Minnesota Statues 103B.251, before entering a commitment to incur project costs for construction of a capital project, the Board of Managers must hold a public hearing and formally order the project. Once the project has been ordered, the District may commit ad valorem funds to design or construction. Although the intent here is for project design and construction costs to be fully funded from the Applicant's escrow, the project was presented for public hearing on October 20, 2022 because it is a substantial project that may be of public interest, and in the event that District ad valorem funds should be sought to be expended on the project. The public hearing was duly noticed and no public comments were received. The District-City agreement went to the City's Council Meeting for approval on November 21, 2022. The City Council approved the agreement unanimously.

<u>Ordering of the Lamplighter Pond Water Quality Project</u>
The Board of Managers is asked to formally order the Project and to approve the District-City agreement under Resolution 22-075.

Following project ordering, the anticipated milestones include:

- December – January 2023: Finalize design
- February – March 2023: Project bidding
- Spring – Fall 2023: Construction

Supporting Documents:

- Attachment 1: Lamplighter Pond Water Quality Project Cooperative Agreement
- Attachment 2: Lamplighter Pond Water Quality Project Feasibility Study

MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

RESOLUTION

Resolution number: 22-075

Title: Ordering Lamplighter Pond Water Quality Project and Approving Project Agreement with City of St. Louis Park

WHEREAS, the Board of Managers approved a request for variance from the Minnehaha Creek Watershed District Stormwater Management rule for Permit #18-153 on August 23, 2018. As a condition of the variance, the District and Healthy Way of Life, LLC executed a cooperative agreement to fund a regional stormwater management project to provide an equivalent amount of stormwater treatment to what would have been required on-site and Healthy Way of Life, LLC placed $490,000 in an escrow held by the District.

WHEREAS, on December 16, 2021 the Board authorized a contract with Stantec to perform a feasibility study of a manufactured treatment device (MTD).

WHEREAS, the feasibility study was completed in August 2022 recommending the MTD be constructed at Northside Park, 2200 Louisiana Ave S, St Louis Park, MN 55426 in the eastern boulevard to Nevada Avenue adjacent to the Northside Park parking lot. The project would remove 7.2 lbs/year of phosphorus, thus meeting the terms of the District-Lifetime agreement. The estimated construction cost for the project is $289,000

WHEREAS, on October 20, 2022 a public hearing was duly noticed and held, and no public comments were received.

WHEREAS, on November 21, 2022 the St. Louis Park City Council unanimously approved a cooperative agreement outlining the roles and responsibilities of the City and District in advancing the project. The agreement reflects that the City will be responsible for project design, construction, and maintenance, in coordination with the District. The City may invoice the District from time to time for design and construction costs incurred, and the District will disburse escrow funds in reimbursement. Remaining escrow funds up to the present value of the maintenance commitment also will be paid over to the City to fund ongoing maintenance.

WHEREAS, the Board of Managers finds that project will be conducive to public health and promote the general welfare; is in compliance with Minnesota Statutes 103B.205 to 103B.255 and the District's watershed management plan; and conforms to the terms of the escrow agreement; and further finds that the proposed project agreement with the City of St. Louis Park contains reasonable terms for the design, installation and maintenance of the project in the public interest;

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers orders the Lamplighter Pond Water Quality Project; and

BE IT FURTHER RESOLVED that the Board of Managers approves the project agreement and authorizes its execution by the Board President, with any further non-material changes and on advice of counsel.

Resolution Number 22- 075 was moved by Manager _____, seconded by Manager _____. Motion to adopt the resolution ___ ayes, ___ nays, ___abstentions. Date.

_____ Date: _____
Secretary

MINNEHAHA CREEK WATERSHED DISTRICT

QUALITY OF WATER QUALITY OF LIFE

COOPERATIVE AGREEMENT

City of St. Louis Park and Minnehaha Creek Watershed District

Lamplighter Pond Water Quality Project

This Cooperative Agreement ("Agreement") is made by and between the Minnehaha Creek Watershed District, a watershed district with purposes and powers as set forth at Minnesota Statutes Chapters 103B and 103D ("District"), and the City of St. Louis Park, a home rule charter city of the State of Minnesota ("City") (together, the "Parties").

BACKGROUND

A. In 2018, Healthy Way of Life I, LLC ("Permittee") applied to the District for a permit to expand its St. Louis Park facility. As a result of site limitations, the District Board of Managers approved a variance allowing Permittee to submit an escrow in the amount of $490,000, in lieu of construction and perpetual maintenance of stormwater management facilities on site. The escrow agreement affords the District the right to use the escrow to identify, design, construct and maintain a stormwater treatment practice within the relevant stormwater subwatershed to achieve abstraction of 28,734 cubic feet of stormwater runoff volume annually, or the equivalent annual removal of 7.2 pounds of total phosphorus (TP).

B. The District engineer, Stantec, evaluated potential sites. On the basis of Stantec's work, District and City staff have identified a location, downgradient from the Lamplighter Pond outlet lift station, for installation of a stormwater filtration device. The proposed device is a Contech StormFilter (CSF), consisting of an underground concrete rectangular vault that uses 27" PhosphoSorb media cartridges for filtration.

C. The Stantec feasibility report (August 17, 2022), Attachment A to this Agreement, reviews several location and configuration options for the CSF. The District and the City have reviewed the feasibility report and concur in the option designated as Option 5 in the report. The CSF vault is to be located at the terminal point of the force main from Lamplighter Pond, within a grassed island on the eastern boulevard of Nevada Avenue, adjacent to the Northside Park parking lot (the "Project").

D. The District and City wish to collaborate in the installation and maintenance of the CSF. The Parties agree that the City should design, install, own and maintain the Project as an element of its stormwater management and conveyance system. The purpose of this Agreement is to specify the terms for the City's design, construction, operation and maintenance of the Project, and its reimbursement for costs from the escrow held by the District.

TERMS

1. The City, after consulting with the District, will select an engineering firm to prepare a design to implement the identified option. The design is subject to District approval, which the District will provide on its determination that the design sizing and specifications will achieve an annual total phosphorus reduction of at least 7.2 pounds, that it incorporates adequate winter protection, and that it will be durable.

2. The City will procure a contractor in accordance with applicable law, and will construct the Project. The City will invite the District to a pre-construction meeting and will advise the District during construction, at times arranged by the parties, so that the District may observe construction. The City will consult with the District before approving any work change that may affect the bases for District design approval under paragraph 1, above. The City will provide for the Project to be constructed and functional by October 31, 2023, and will use all best efforts to achieve that date.

3. From time to time, but no more frequently than every 30 days, the City may request reimbursement of design and construction costs incurred. The District may request reasonable documentation of costs, and will make payment to the City promptly, from the Project escrow.

4. The City will notify the District when construction of the Project is substantially complete, and complete. On completion, the City will provide the District a copy of the engineer's record drawings; the Parties will perform an accounting of project costs; and reimbursement will be completed. In addition, the District, on consultation with the City, will calculate the present value of 20 years of future maintenance, which amount the District will pay to the City from Project escrow.

5. The City and the District will concur on the design and content of public information about the Project that conforms to Project scale and visibility. The District will consult with Permittee and incorporate recognition of Permittee's participation in the Project as appropriate. The City will incorporate the public information element into the design.

6. The City will operate, inspect and maintain the Project, including the public information, for its useful life in accordance with the "StormFilter Inspection and Maintenance Procedures" (Contech Engineered Solutions, April 2020), Attachment B to this Agreement, as they may be updated by the manufacturer from time to time. The City will schedule valve opening and closing on the basis of its assessment of freezing conditions, and consistent with that will maximize the portion of the year that the Project is operating. On the request of either Party, when the Project approaches the end of its useful life, the Parties will consult as to extending or replacing the Project.

7. The District's obligation to reimburse under section 3, above, is contingent on the City's completion of the Project in material conformance to the plans as approved by the District. If the City does not so complete the Project, it will return to the District all funds paid by the District from the escrow.

8. The escrow balance at the time this Agreement takes effect is $462,200, reflecting a deduction for the cost of the feasibility work to date. The District is not responsible to the City for reimbursement greater than this amount. The City is responsible for all costs associated with its obligations under this Agreement above $462,200. Each Party will bear its own internal and administrative costs to implement the Agreement.

9. This Agreement is not a joint powers agreement within the meaning of Minnesota Statutes §471.59 and nothing herein constitutes a Party's agreement to be responsible for the acts or omissions of the other party within the meaning of subdivision 1a(a) of that statute. Notwithstanding anything to the contrary in this Agreement, each party is responsible for its own acts and omissions, and the results thereof, to the extent authorized by law and will not be responsible for the acts and omissions of the other party or the results thereof. This Agreement creates no right in any third party; waives no immunity, defense or liability limit with respect to any third party or the other party to this Agreement; and creates no relationship of third-party beneficiary, principal and agent, partnership, or joint venture as between the City and District. Only contractual remedies are available for the failure of a Party to fulfill the terms of this Agreement.

10. Each notice required by this Agreement must be made to the project representative. The project representatives of the Parties are:

Kayla Westerlund, Permitting Program Manager
Minnehaha Creek Watershed District
15320 Minnehaha Boulevard
Minnetonka, MN 55345
(952) 473-2855

Erick Francis, Water Resources Manager
City of St. Louis Park
5005 Minnetonka Blvd.
St. Louis Park, MN 55416
(952) 924-2690

Contact information will be kept current. Either contact may be changed by written notification to the other Party.

11. An amendment to this Agreement must be in writing and will not be effective until it has been executed and approved by the Parties. A Party may not assign or transfer any right or obligation hereunder without an assignment agreement executed by the Parties and the assignee.

12. A Party's failure to enforce a provision of this Agreement does not waive the provision or that Party's right to enforce it subsequently.

13. This Agreement is effective when fully executed by the Parties.

IN TESTIMONY WHEREOF the parties have executed this Agreement by their authorized officers, intending to be legally bound.

CITY OF ST. LOUIS PARK

By _____ Date:
Its Mayor

By _____ Date:
Its City Manager

Approved for form and execution:

_____
MCWD Counsel

MINNEHAHA CREEK WATERSHED DISTRICT

By _____ Date:
Its President

Stantec

Memo

To:	Kayla Westerlund, Permitting Program Manager Minnehaha Creek Watershed District	From:	Todd Shoemaker, PE, CFM Brendan Barth, EIT Lucas Clapp
File:	227704758	Date:	August 17, 2022

Reference: Lamplighter Pond Feasibility Study

INTRODUCTION

Minnehaha Creek Watershed District (MCWD) hired Stantec to study the feasibility of installing a manufactured treatment device (MTD) to improve the quality of water discharging from Lamplighter Pond in St. Louis Park (Figure 1). In studying the feasibility, Stantec prepared this memorandum and the attached design plans to summarize water quality performance, site design, and the project's estimated cost.

Figure 1: Lamplighter Pond MTD Project Location Map

Reference: **Lamplighter Pond Feasibility Study**

BACKGROUND

In 2018, the MCWD Board of Managers approved a variance for Lifetime Fitness to contribute a fee in lieu of constructing a stormwater control measure (SCM) at their site in St. Louis Park. The variance condition states that the stormwater management system must remove of 7.2-lbs TP and abstract 28,734-cf of stormwater runoff volume on an average annual basis. Since approving the variance, MCWD has evaluated several potential sites and SCMs on public and private property in the Twin Lake Watershed. Due to poorly infiltrating soils and the potential for soil contamination, the City and MCWD staff concluded that the preferred SCM is an MTD adjacent to Lamplighter Pond. Since the selected SCM is filtration, the required treatment volume doubles to 57,468-cf per MCWD rules.

MTD OPTIONS

An existing lift station functions as the primary outlet of Lamplighter Pond. First, a pump pulls stormwater from the pond through a screening manhole that removes large floatables and debris. Stormwater then gravity drains from the screening manhole to the lift station wet well where it is pumped out of the system through a force main.

The MTD will have a newly installed lift station to pump water to a Contech StormFilter (MTD). The system will pull water from the existing screening manhole to a new wet well with trash basket. The lift station wet well will pump water to the StormFilter unit. The unit is an underground concrete rectangular chamber and will utilize filtration through 27" PhosphoSorb media Cartridges. The filter will drain water back into Lamplighter Pond via gravity. A virtual meeting with MCWD and City staff determined the preferred approach would be to utilize a separate 480V service and control system to operate the new lift station. See Table 1 for a summary of the three MTD sizes considered. Influent TP concentrations, TP removals, and annual cost per pound TP removed were calculated using the following assumptions:

- TP influent concentration from watershed assumed to be 0.37 mg/L based on available field data
- StormFilter TP removal efficiency assumed to be 70-percent based on available field data
  - 80-percent particulate phosphorus (PP) removed
  - 40-percent dissolved phosphorus (DP) removed
- PP:DP ratio of 75:25

Table 1: Contech StormFilter Design Considerations

Option	# Cartridges	Vault Dimensions	Maximum Treatment Flow Rate (cfs)	Estimated TSS Mass Capacity (lbs)	Estimated Volume Treated (cf)	Estimated TP Influent (lbs)	Estimated TP removal (lbs)	Estimated Cost	Estimated Annual Maint Cost	Estimated 20-yr life cycle cost	Estimated Annual $/lb TP removed
1	(29) 27" PhosphoSorb cartridges @ 1 gpm/sf	8x14	0.73	1566	441408	10.2	7.1	**$103,020**	$8,265	$268,320	$1,881
2	(54) 27" PhosphoSorb cartridges @ 1 gpm/sf	8x22	1.35	2916	827640	19.1	13.4	**$188,000**	$14,580	$479,600	$1,793
3	(101) 27" PhosphoSorb cartridges @ 1gpm/sf	11x29	2.53	5454	1555963	35.9	25.1	**$222,000**	$27,270	$767,400	$1,527

Reference: **Lamplighter Pond Feasibility Study**

The number of cartridges and pump flow rate affect the material cost, TP removal, and maintenance costs for the three options listed above. The “Estimated Cost” column is for the StormFilter only; it does not include additional construction costs. Option 1 can be considered the “baseline” to satisfy project requirements. Alternatively, Options 2 or 3 could be selected to achieve greater TP removal if funding were available for the increased construction and maintenance costs.

MTD PERFORMANCE & COST

The list below summarizes the total construction cost and expected TP removal for the three options. For each of the three options, the pump would need to operate for approximately 170-hours between March and October (months with above freezing temperatures) to achieve the estimated TP removals. The pump will need to cycle on and off throughout the year, independent of rain events, to allow the StormFilter cartridges dry out in order to maintain the anticipated TP removal efficiencies presented in Table 1. The actual pump operating schedule will be coordinated with MCWD and City during final design. Refer to Appendix A for detailed opinions of probable cost for each option. Stantec has shared the annual maintenance costs listed with City staff for verification against a similar system elsewhere in the city. For all options, we estimate final design, bidding, and construction observation will cost an additional $50,000.

Option 1

- 7.2 lb/yr TP removed
- $320,000 construction cost
- $8,500 annual maintenance cost

Option 2

- 13.4 lb/yr TP removed
- $450,000 construction cost
- $14,500 annual maintenance cost

Option 3

- 25.1 lb/yr TP removed
- $500,000 construction cost
- $27,000 annual maintenance cost

CITY REVIEW & COMMENTS

City of St. Louis Park staff reviewed a draft of this feasibility study and agreed with the MTD option and its placement within city-owned property. However, City staff were concerned about the maintenance and cost of the additional lift station necessary to get water into the MTD.

Therefore, City staff recommended re-locating the MTD to a location downstream at the point of discharge for the existing lift station. This change would avoid the cost of the lift station and additional maintenance commitment. City staff identified the eastern boulevard of Nevada Avenue adjacent to the Northside Park parking lot. This is the discharge location of the Lamplighter Pond forcemain and where it changes to gravity flow.

Reference: **Lamplighter Pond Feasibility Study**

STANTEC REVIEW OF NEW LOCATION

The new location was not part of Stantec's scope of work for this study, so we conducted an abbreviated hydraulic review to determine the viability of the new location. Using City-provided design plans, we evaluated how water could be diverted from the outlet of the forcemain into the MTD and back into the gravity storm sewer. Our findings include:

- Elevations are problematic. Approximately 2.5 ft of fill is necessary to increase the outlet elevation of the forcemain and provide sufficient drop for filtration through the MTD. Coordination with the City is necessary to determine feasibility of proposed grading with the surrounding parking lot, sidewalk, road, trees, etc.
- A more detailed review of the existing lift station pump curves is necessary. There does not appear to be a significant concern, but there would likely be a slight reduction in pumping capacity due to the addition of 2.5 feet of static head.
- Figures 2 and 3 show the potential layout at the discharge end of the forcemain.
- Stantec and City staff visited the site on August 5, 2022 to further review installation feasibility. Observations from that site visit include:
    - The MTD vault and diversion manhole will likely stick out of the ground approximately 2.5 to 3 feet. This is acceptable to the city.
    - Vault installation will likely require reconstruction of the parking lot surrounding the peninsula where the vault will be installed.
    - Removal of one tree appears necessary. This tree will have to be replaced per City ordinance.
    - Raising the forcemain discharge pipe closer to the ground surface may allow freezing temperatures to limit performance of the lift station. Therefore, the City recommends:
        - Installation of a valve and bypass pipe upstream of the diversion manhole so the MTD can be taken off-line during the winter and the forcemain may operate as it does today during frozen temperatures.
        - Insulation of the new, raised forcemain pipe and/or build-up additional ground surrounding the diversion manhole to further insulate the pipe.

NEW LOCATION PERFORMANCE & COST

Stantec re-evaluated the expected TP removal, annual maintenance cost, and total construction cost for the new location. Like the prior analysis, we evaluated three options, but this time with the same level of TP removal (7.2 lb/yr) and variable maintenance costs based on influent concentrations. As listed below, Option 4 is based on an assumed TSS influent concentration of 25 mg/L. This is the typical design approach for runoff into the MTD; however, this application is a bit different because water going through the filter will already have been treated in the Lamplighter Pond. Therefore, MTD loading and maintenance may not be driven by TSS influent.

An alternative approach is to design based on the MTD's capacity to remove dissolved phosphorus. With this approach, it's appropriate to evaluate performance using a range of influent TP concentrations because the maintenance trigger will be more about the sorption capacity in the media rather than surface clogging by TSS. Therefore, Option 5 considers a higher influent concentration (more available to remove), and Option 6 considers a lower influent concentration (less, harder to remove). Additionally, Option 6 may allow for the maintenance interval to be extended to two years. The MTD vendor we have coordinated with reports that a similar system in Capitol Region Watershed District is located downstream of pretreatment and a 10' pipe gallery. The MTD lasted approximately 1.5 years before being maintained, and it was undersized by a factor of 2. (So, if sized appropriately it may have lasted 3 years.)

Reference: **Lamplighter Pond Feasibility Study**

Refer to Appendix A for detailed opinions of probable cost for each option. For all options, we estimate final design, bidding, and construction observation will cost an additional $50,000.

Option 4

- 7.2 lb/yr TP removed
- Max treatment flow = 0.73 cfs
- $271,000 construction cost
- $8,300 annual maintenance cost

Option 5

- 7.2 lb/yr TP removed
- Max treatment flow = 0.80 cfs
- $289,000 construction cost
- $9,200 annual maintenance cost

Option 6

- 7.2 lb/yr TP removed
- Max treatment flow = 1.55 cfs
- $469,000 construction cost
- $17,400 annual maintenance cost (It may be appropriate to spread over 2-3 years.)

Table 2: Contech StormFilter Design Considerations for Options 4-6

Option	# 27" PhosphoSorb Cartridges	Vault Dimensions	Maximum Treatment Flow Rate (cfs)	Estimated TSS Mass Capacity (lbs)	Estimated Volume Treated (cf)	Estimated TP Influent (lbs)	Estimated TP removal (lbs)	Estimated Cost	Cartridge Replacement Cost	Estimated Maintenance Interval (yrs)	Estimated 20-yr life cycle cost	Estimated Annual $/lb TP removed	Sizing Notes
4	29	8x14	0.73	1566	1200000	13.48	7.2	**$103,020**	$8,265	1.0	$268,320	$1,871	25 mg/L TSS mass capacity
5	32	8x14	0.80	1728	1200000	13.48	7.2	**$113,710**	$9,120	1.0	$296,110	$2,056	High end of lab TP capacity
6	61	8x24	1.55	3348	1200000	13.48	7.2	**$211,600**	$17,385	1.0	$559,300	$3,884	Low end of lab TP capacity

PROJECT SCHEDULE

If MCWD and the City wish this project to move forward, we have outlined an approximate schedule below:

- September – November: Final design
- December – January: Project bidding
- Spring – Summer 2023: Construction
- August 27, 2023: Deadline for MCWD to order project per agreement with Lifetime

NEXT STEPS

Stantec understands that MCWD and City staff will consider this memo and evaluate Options 4-6 to determine the final design. Once decided, Stantec will provide MCWD with a proposal to prepare the final design and bidding documents.

NORTHSIDE PARK CONCEPT MTD DESIGN

DRAWING NUMBER
232-SS

STORM SEWER ST. LOUIS PARK, MINNESOTA			
PLAN BY G. L. W.	ORR-SCHELEN-MAYERON & ASSOCIATES, INC. CONSULTING ENGINEERS MINNEAPOLIS, MINNESOTA		CHECKED BY R.A.H.
PROFILE BY G. L. W.			APPROVED BY R.J.H.
AS BUILT G. K.			PROJECT NO 66-2
DRAWING NO 32	DATE JANUARY 30, 1967	SCALE HOR. 1" = 50' VERT 1" = 10'	COMM NO.

PLAN — SURVEYED / DRAWN / ALIGNMENT CHECKED / RT. OF WAY CHECKED / NOTE BOOK / NO. / DATE / BY

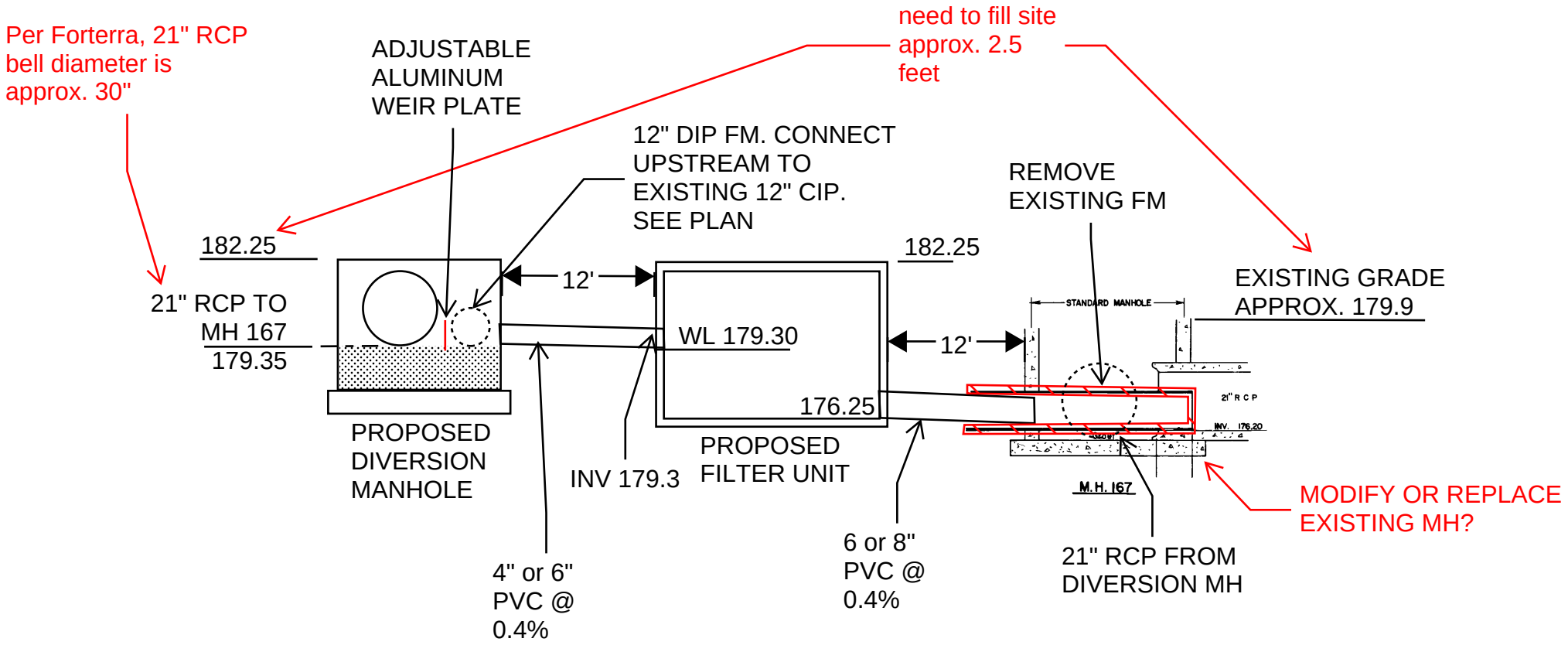
PROFILE — SURVEYED / DRAWN / PAGES CHECKED / NOTE BOOK / NO. / DATE / BY

DRAWING NUMBER
232-SS
STORM SEWER
FRANKLIN EXT. , NEVADA

MICROFILMED

32

Influent pipe size and weir heights (calculated as head requirement using hazen-williams) required for each design flow:
0.73 cfs - 4" pipe; 7.5" weir
1.35 cfs - 4" pipe; 23" weir
2.53 cfs - 6" pipe; 10.5" weir



Stormtech Filter Design Requirements:
Bottom Inv. = minus 6.5 feet from top (includes 6"concrete top)
Water level = 3.05 feet above bottom inv
Design flows = 0.73 cfs, 1.35 cfs, or 2.53 cfs
Require time to allow filters to dry out

CONCEPT SKETCH - NOT TO SCALE

APPENDIX A.1

Option 1: Opinion of Probable Cost

Lamplighter Pond Filter System					
ITEM	**DESCRIPTION**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**
1	Mobilization	1	LS	$ 27,000.00	$ 27,000.00
2	Transplant Tree	1	EA	$ 750.00	$ 750.00
3	Sawcut & Remove Concrete Curb	51	LF	$ 12.00	$ 612.00
4	Remove & Replace Asphalt Trail	47	SY	$ 60.00	$ 2,800.00
5	Sawcut & Remove 8" Concrete Pavement	222	SF	$ 2.78	$ 616.67
6	Common Excavation (CV, offsite)	62	CY	$ 25.00	$ 1,550.00
7	Lift Station Pump and Appurtenances	1	LS	$ 69,000.00	$ 69,000.00
8	84" Dia. Precast Lift Station Structure	1	LS	$ 17,500.00	$ 17,500.00
9	6" C900 Forcemain	25	LF	$ 50.00	$ 1,250.00
10	10" PVC Gravity Pipe	40	LF	$ 60.00	$ 2,400.00
11	Connect 10" Pipe to Ex. Screening Manhole	1	EA	$ 5,000.00	$ 5,000.00
12	Connect 10" Pipe to Ex. Lift Station Wet Well	1	EA	$ 2,500.00	$ 2,500.00
13	Concrete Curb & Gutter (match existing)	51	LF	$ 55.00	$ 2,805.00
14	8" Reinforced Concrete Pavement	222	SF	$ 12.00	$ 2,664.00
15	StormFilter Vault & Cartridges	1	EA	$ 134,000.00	$ 134,000.00
16	Class 5	15	TON	$ 55.00	$ 821.33
17	Site Electrical and Controls Programming	1	LS	$ 15,000.00	$ 15,000.00
18	Sediment Control Log - Type Compost	90	LF	$ 4.50	$ 405.00
19	Silt Fence	125	LF	$ 4.00	$ 500.00
20	Salvage & respread topsoil	1	LS	$ 1,000.00	$ 1,000.00
21	MN State Seed Mix 25-131 (Low Maintenance Turf)	11	LB	$ 7.50	$ 82.50
22	Erosion Control Blanket Category 3N, 2S	212	SY	$ 4.00	$ 848.89
TOTAL					$ 289,105.39
CONTINGENCY (10% ASSUMED)					$ 29,000.00
TOTAL					**$ 318,105.39**

APPENDIX A.2

Option 2: Opinion of Probable Cost

Lamplighter Pond Filter System					
ITEM	**DESCRIPTION**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**
1	Mobilization	1	LS	$ 38,000.00	$ 38,000.00
2	Transplant Tree	1	EA	$ 750.00	$ 750.00
3	Sawcut & Remove Concrete Curb	51	LF	$ 12.00	$ 612.00
4	Remove & Replace Asphalt Trail	47	SY	$ 60.00	$ 2,800.00
5	Sawcut & Remove 8" Concrete Pavement	222	SF	$ 2.78	$ 616.67
6	Common Excavation (CV, offsite)	62	CY	$ 25.00	$ 1,550.00
7	Lift Station Pump and Appurtenances	1	LS	$ 69,000.00	$ 69,000.00
8	84" Dia. Precast Lift Station Structure	1	LS	$ 17,500.00	$ 17,500.00
9	6" C900 Forcemain	25	LF	$ 50.00	$ 1,250.00
10	10" PVC Gravity Pipe	40	LF	$ 60.00	$ 2,400.00
11	Connect 10" Pipe to Ex. Screening Manhole	1	EA	$ 5,000.00	$ 5,000.00
12	Connect 10" Pipe to Ex. Lift Station Wet Well	1	EA	$ 2,500.00	$ 2,500.00
13	Concrete Curb & Gutter (match existing)	51	LF	$ 55.00	$ 2,805.00
14	8" Reinforced Concrete Pavement	222	SF	$ 12.00	$ 2,664.00
15	StormFilter Vault & Cartridges	1	EA	$ 245,000.00	$ 245,000.00
16	Class 5	15	TON	$ 55.00	$ 821.33
17	Site Electrical and Controls Programming	1	LS	$ 15,000.00	$ 15,000.00
18	Sediment Control Log - Type Compost	90	LF	$ 4.50	$ 405.00
19	Silt Fence	125	LF	$ 4.00	$ 500.00
20	Salvage & respread topsoil	1	LS	$ 1,000.00	$ 1,000.00
21	MN State Seed Mix 25-131 (Low Maintenance Turf)	11	LB	$ 7.50	$ 82.50
22	Erosion Control Blanket Category 3N, 2S	212	SY	$ 4.00	$ 848.89
TOTAL					$ 411,105.39
CONTINGENCY (10% ASSUMED)					$ 42,000.00
TOTAL					**$ 453,105.39**

APPENDIX A.3

Option 3: Opinion of Probable Cost

Lamplighter Pond Filter System					
ITEM	**DESCRIPTION**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**
1	Mobilization	1	LS	$ 42,000.00	$ 42,000.00
2	Transplant Tree	1	EA	$ 750.00	$ 750.00
3	Sawcut & Remove Concrete Curb	51	LF	$ 12.00	$ 612.00
4	Remove & Replace Asphalt Trail	47	SY	$ 60.00	$ 2,800.00
5	Sawcut & Remove 8" Concrete Pavement	222	SF	$ 2.78	$ 616.67
6	Common Excavation (CV, offsite)	62	CY	$ 25.00	$ 1,550.00
7	Lift Station Pump and Appurtenances	1	LS	$ 69,000.00	$ 69,000.00
8	84" Dia. Precast Lift Station Structure	1	LS	$ 17,500.00	$ 17,500.00
9	6" C900 Forcemain	25	LF	$ 50.00	$ 1,250.00
10	10" PVC Gravity Pipe	40	LF	$ 60.00	$ 2,400.00
11	Connect 10" Pipe to Ex. Screening Manhole	1	EA	$ 5,000.00	$ 5,000.00
12	Connect 10" Pipe to Ex. Lift Station Wet Well	1	EA	$ 2,500.00	$ 2,500.00
13	Concrete Curb & Gutter (match existing)	51	LF	$ 55.00	$ 2,805.00
14	8" Reinforced Concrete Pavement	222	SF	$ 12.00	$ 2,664.00
15	StormFilter Vault & Cartridges	1	EA	$ 289,000.00	$ 289,000.00
16	Class 5	15	TON	$ 55.00	$ 821.33
17	Site Electrical and Controls Programming	1	LS	$ 15,000.00	$ 15,000.00
18	Sediment Control Log - Type Compost	90	LF	$ 4.50	$ 405.00
19	Silt Fence	125	LF	$ 4.00	$ 500.00
20	Salvage & respread topsoil	1	LS	$ 1,000.00	$ 1,000.00
21	MN State Seed Mix 25-131 (Low Maintenance Turf)	11	LB	$ 7.50	$ 82.50
22	Erosion Control Blanket Category 3N, 2S	212	SY	$ 4.00	$ 848.89
TOTAL					$ 459,105.39
CONTINGENCY (10% ASSUMED)					$ 46,000.00
TOTAL					**$ 505,105.39**

APPENDIX A.4

Option 4: Opinion of Probable Cost

Options 4. Northside Park Filter System					
ITEM	**DESCRIPTION**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**
1	Mobilization	1	LS	$ 23,000.00	$ 23,000.00
2	Remove Concrete Sidewalk	22	SY	$ 20.00	$ 444.44
3	Sawcut & Remove Concrete Curb	110	LF	$ 12.00	$ 1,320.00
4	Concrete Sidewalk	200	SF	$ 25.00	$ 5,000.00
5	Remove & Replace Bituminous Street	1	LS	$ 10,000.00	$ 10,000.00
6	Remove & Replace Bituminous Parking Lot	1	LS	$ 5,000.00	$ 5,000.00
7	Remove Tree	1	EA	$ 400.00	$ 400.00
8	21" RCP	16	LF	$ 100.00	$ 1,600.00
9	Common Excavation (CV, offsite)	29	CY	$ 25.00	$ 713.13
10	5' Diversion MH	1	EA	$ 15,000.00	$ 15,000.00
11	6" C-900 PVC	24	LF	$ 75.00	$ 1,800.00
12	Modify Existing MH 167	1	EA	$ 5,000.00	$ 5,000.00
13	Install New Forcemain	33	LF	$ 100.00	$ 3,300.00
14	Reconnect Existing Forcemain	33	LF	$ 100.00	$ 3,300.00
15	Install Valve	2	EA	$ 3,000.00	$ 6,000.00
16	Concrete Curb & Gutter (match existing)	110	LF	$ 55.00	$ 6,050.00
17	StormFilter Vault & Cartridges	1	EA	$ 155,000.00	$ 155,000.00
18	Class 5	15	TON	$ 55.00	$ 821.33
19	Sediment Control Log - Type Compost	90	LF	$ 4.50	$ 405.00
20	Replace Tree	1	EA	$ 500.00	$ 500.00
21	Salvage & respread topsoil	1	LS	$ 1,000.00	$ 1,000.00
22	MN State Seed Mix 25-131 (Low Maintenance Turf)	10	LB	$ 7.50	$ 75.00
23	Erosion Control Blanket Category 3N, 2S	22	SY	$ 5.00	$ 111.11
TOTAL					$ 245,840.01
CONTINGENCY (10% ASSUMED)					$ 25,000.00
TOTAL					**$ 270,840.01**

APPENDIX A.5

Option 5: Opinion of Probable Cost

Option 5. Northside Park Filter System					
ITEM	**DESCRIPTION**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**
1	Mobilization	1	LS	$ 24,000.00	$ 24,000.00
2	Remove Concrete Sidewalk	22	SY	$ 20.00	$ 444.44
3	Sawcut & Remove Concrete Curb	110	LF	$ 12.00	$ 1,320.00
4	Concrete Sidewalk	200	SF	$ 25.00	$ 5,000.00
5	Remove & Replace Bituminous Street	1	LS	$ 10,000.00	$ 10,000.00
6	Remove & Replace Bituminous Parking Lot	1	LS	$ 5,000.00	$ 5,000.00
7	Remove Tree	1	EA	$ 400.00	$ 400.00
8	21" RCP	16	LF	$ 100.00	$ 1,600.00
9	Common Excavation (CV, offsite)	29	CY	$ 25.00	$ 713.13
10	5' Diversion MH	1	EA	$ 15,000.00	$ 15,000.00
11	6" C-900 PVC	24	LF	$ 75.00	$ 1,800.00
12	Modify Existing MH 167	1	EA	$ 5,000.00	$ 5,000.00
13	Install New Forcemain	33	LF	$ 100.00	$ 3,300.00
14	Reconnect Existing Forcemain	33	LF	$ 100.00	$ 3,300.00
15	Install Valve	2	EA	$ 3,000.00	$ 6,000.00
16	Concrete Curb & Gutter (match existing)	110	LF	$ 55.00	$ 6,050.00
17	StormFilter Vault & Cartridges	1	EA	$ 170,000.00	$ 170,000.00
18	Class 5	15	TON	$ 55.00	$ 821.33
19	Sediment Control Log - Type Compost	90	LF	$ 4.50	$ 405.00
20	Replace Tree	1	EA	$ 500.00	$ 500.00
21	Salvage & respread topsoil	1	LS	$ 1,000.00	$ 1,000.00
22	MN State Seed Mix 25-131 (Low Maintenance Turf)	10	LB	$ 7.50	$ 75.00
23	Erosion Control Blanket Category 3N, 2S	22	SY	$ 5.00	$ 111.11
TOTAL					$ 261,840.01
CONTINGENCY (10% ASSUMED)					$ 27,000.00
TOTAL					**$ 288,840.01**

APPENDIX A.6

Option 6: Opinion of Probable Cost

Option 6. Northside Park Filter System					
ITEM	**DESCRIPTION**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**
1	Mobilization	1	LS	$ 39,000.00	$ 39,000.00
2	Remove Concrete Sidewalk	22	SY	$ 20.00	$ 444.44
3	Sawcut & Remove Concrete Curb	110	LF	$ 12.00	$ 1,320.00
4	Concrete Sidewalk	200	SF	$ 25.00	$ 5,000.00
5	Remove & Replace Bituminous Street	1	LS	$ 10,000.00	$ 10,000.00
6	Remove & Replace Bituminous Parking Lot	1	LS	$ 5,000.00	$ 5,000.00
7	Remove Tree	1	EA	$ 400.00	$ 400.00
8	21" RCP	16	LF	$ 100.00	$ 1,600.00
9	Common Excavation (CV, offsite)	46	CY	$ 25.00	$ 1,150.00
10	5' Diversion MH	1	EA	$ 15,000.00	$ 15,000.00
11	6" C-900 PVC	24	LF	$ 75.00	$ 1,800.00
12	Modify Existing MH 167	1	EA	$ 5,000.00	$ 5,000.00
13	Install New Forcemain	33	LF	$ 100.00	$ 3,300.00
14	Reconnect Existing Forcemain	33	LF	$ 100.00	$ 3,300.00
15	Install Valve	2	EA	$ 3,000.00	$ 6,000.00
16	Concrete Curb & Gutter (match existing)	110	LF	$ 55.00	$ 6,050.00
17	StormFilter Vault & Cartridges	1	EA	$ 318,000.00	$ 318,000.00
18	Class 5	15	TON	$ 55.00	$ 821.33
19	Sediment Control Log - Type Compost	90	LF	$ 4.50	$ 405.00
20	Replace Tree	1	EA	$ 500.00	$ 500.00
21	Salvage & respread topsoil	1	LS	$ 1,000.00	$ 1,000.00
22	MN State Seed Mix 25-131 (Low Maintenance Turf)	10	LB	$ 7.50	$ 75.00
23	Erosion Control Blanket Category 3N, 2S	22	SY	$ 5.00	$ 111.11
TOTAL					$ 425,276.89
CONTINGENCY (10% ASSUMED)					$ 43,000.00
TOTAL					**$ 468,276.89**