

REPORT / RECOMMENDATION



To: MAYOR AND COUNCIL

Agenda Item #: IV. E.

From: Ross Bintner P.E., Environmental Engineer

Action

Discussion

Date: August 18, 2015

Information

Subject: Authorize Professional Services, Bolton & Menk, Inc. – Presidents’ Area Sanitary Sewer Rehabilitation Design & Construction Services

Action Requested:

Authorize City Manager to sign professional services proposal with Bolton & Menk, Inc. for Presidents’ Area sanitary sewer rehabilitation design and construction services.

Information / Background:

The project serves the purpose of repairing aging infrastructure, reducing infiltration and inflow of stormwater into the sanitary sewer system, and rehabilitating a sanitary system that is troubled with backups. This project is described in CIP item 15-148 and the attached technical memorandum from Barr Engineering.

This project is eligible for a small amount of grant reimbursement from grant funding secured through the Metropolitan Council as part of its 2014 State Bond fund I/I grant. The attached proposal from Bolton and Menk Inc, proposes to develop plans and specifications for project area 3, and increase the scope of the project if possible to include part of project area 1, rehabilitating as much of the system as possible under the budget described in the CIP.

The proposed schedule would include design in fall and winter 2015, and construction winter and spring of 2016. Project and funding source summaries follow:

Project funding summary:

ITEM	COST / ESTIMATE	SCHEDULE
Project area 1 and 3 Design	\$73,500 (not to exceed)	Fall 2015
Project area 1 and 3 project management	\$70,000 (estimate)	Winter 2015/2016
Project area 1 and 3 construction	\$884,200 (estimate)	Winter 2015/2016
TOTAL	\$1,027,700 (estimate)	

Funding Sources summary:

ITEM	AMOUNT	CITY COUNCIL DATE
2015 CIP #15-148	\$1,000,000	2014
Met Council I/I abatement grant	\$27,700	8/18/2015
TOTAL	\$1,027,700	

Attachments:

Supplemental Letter Agreement – Bolton and Menk
Met Council 2014 Municipal Grant Program Letter of Intent
Technical Memorandum – Barr Engineering



BOLTON & MENK, INC.[®]

Consulting Engineers & Surveyors

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www.bolton-menk.com

August 7, 2015

Mr. Ross Bintner, P.E., Environmental Engineer
City of Edina – Engineering Department
7450 Metro Boulevard
Edina, MN 55439

RE: SUPPLEMENTAL LETTER AGREEMENT
Presidents Area Sewer Rehabilitation
City of Edina, Minnesota

Dear Mr. Bintner,

Bolton & Menk, Inc. is pleased to present this proposal to you for professional engineering services in support of its Presidents Area Sewer Rehabilitation. As a part of this proposal, we describe our understanding of the project, detail our proposed scope of work, and provide our fees for service. This proposal is being offered as a Supplemental Agreement to our June 18, 2013 Master Agreement for Professional Engineering Services with the City of Edina.

PROJECT UNDERSTANDING

The City of Edina recently completed an analysis of the sanitary sewer in the Presidents Area, downstream of Water Treatment Plant (WTP) #4, in the northwest part of the City. This analysis was documented in a February 27, 2015 memorandum by Barr Engineering. The area begins at WTP #4 and continues south/southeast toward Blake Road/Interlachen Boulevard. The alignment of the sanitary sewer in this area is primarily located in backyards, wooded areas, next to small lakes, and in some cases under homes. According to the analysis, this area has reported back-ups into area homes and a number of the lines have been identified as under-capacity. The analysis concluded three (3) areas that need improvement. Area 1 includes approximately 1,200 lf of sanitary sewer immediately downstream of WTP #4, Area 2 includes approximately 800 lf in the middle of the study area, and Area 3 includes approximately 1,200 lf running east from the Arthur Street/Waterman Avenue intersection southeast ending in Interlachen Boulevard.

Earlier this year, the City secured grant monies from the Metropolitan Council in support of rehabilitating these sewer areas. At this time, the City is interested in proceeding with a grant-eligible project to improve as much of the sanitary sewer in the areas noted above. Area 3 has been identified as the most critical segment, followed by Area 1 and finally Area 2.

As mentioned above, Area 3 includes approximately 1,200 lf of sanitary sewer beginning at the Arthur Street/Waterman Avenue intersection, running east/southeast along the north side of the Mirror Lake south of Blake Road/Interlachen Boulevard, and ending in Interlachen Boulevard. The sanitary sewer alignment runs adjacent to the lake, and in residential backyards. City records indicate that this section of sewer is 9-inch vitrified clay pipe (VCP) that has been slip-lined with a 6-inch HDPE pipe. While no sewer backups are known to have occurred along this line, there is evidence of surcharging in the area. The analysis completed by Barr Engineering states the line should be replaced with a 10" diameter pipe via open-cut construction methods.

The City of Edina has requested this proposal from Bolton & Menk to complete final design, bidding, and construction observation and administration services in support of Area 3 improvements. Understanding that the City has funding from Met Council for a \$1 million dollar project, as design progresses, an engineer's estimate will be completed, and it will be determined if design and construction of additional areas could be included in the project budget, at which time this agreement could be amended.

Bolton & Menk will evaluate a variety of construction options for the sanitary sewer line: directional drilling, pipe-bursting, and open-cut, along with possible alternative alignments if feasible. To facilitate these evaluations, we recommend the City have the sanitary sewer line in area 3 televised prior to beginning final design so we know what services and laterals exist along the line to help determine if alternative alignments are options.

SCOPE OF WORK

Bolton & Menk proposes to complete the following services:

Final Design and Bidding

1. Review Televising Log
2. Topographic survey of Area 3, or alternative alignment, depending on desired replacement options
3. Field confirmation of existing ground cover conditions and sewer manhole locations, conditions and accessibility.
4. Evaluate Design Alternatives
5. Prepare technical construction plans (plan and profile view from topographic survey) and specifications for sanitary sewer construction for Area 3, as identified by Barr Engineering in their 2/27/15 memorandum.
6. Resident Communications
 - a. Informational mailing to affected residents.
 - b. Follow up phone calls to residents to discuss specific project issues and concerns.
 - c. Up to eight (8) meetings to discuss specific project issues and concerns, and to negotiate temporary access to the sanitary sewer system for construction purposes.
 - d. Conduct a neighborhood open house to discuss the final project plans and expectations during construction.
7. Identify temporary sewer bypassing needs and establish parameters for inclusion in bidding documents.
8. Complete and submit required construction permit applications (fees to be paid by City).
9. Prepare project cost estimates.
10. Prepare bidding documents.
11. Advertise project according to standard City practices.
12. Address contractor questions during the bidding period and distribute any necessary addenda.
13. Conduct bid opening, evaluate bids, and make recommendation for project award.
14. City progress meetings (up to 3 meetings).



Construction Services

1. Facilitate execution of construction contract between City and contractor.
2. Conduct preconstruction meeting.
3. Review construction material submittals and shop drawings.
4. Conduct preconstruction neighborhood open house.
5. Provide construction staking services of mainline sanitary sewer.
6. Provide full time construction observation and administration services including, but not limited to, conducting weekly construction meetings, serve as a liaison between the City, its residents and the contractor, review of the work for general conformance with construction documents, review of material test results, maintenance of construction documentation, preparation of pay estimates and any necessary change orders.
7. Completion of record drawings.

Bolton & Menk is prepared to provide full-time construction observation, if the City desires to utilize its own staff for construction services Bolton & Menk will provide assistance as desired during construction. Therefore we are prepared to adjust our levels of construction services in accordance with the City's requests and requirements.

The City will provide Bolton & Menk with survey benchmarks, GIS files to assist in building our base map along with available easement documentation for the utility easement along the sanitary sewer line.

PROPOSED FEES

Estimated fees for the final design and bidding services as described above are summarized as follows:

Evaluate Design Alternatives / Review Televising Logs	\$ 3,600
Topographic Survey	\$ 14,300
Field Confirmation	\$ 2,800
Technical Construction Plans & Specifications	\$ 33,700
Communication with Affected Residents	\$ 4,600
Design Phase Open House	\$ 1,500
Permit Applications	\$ 1,300
Project Cost Estimates	\$ 3,150
Bidding Documents	\$ 2,600
Bidding Assistance	\$ 3,500
City Progress Meetings	<u>\$ 2,450</u>
TOTAL	\$ 73,500

The costs for these individual work tasks are estimates. Bolton & Menk proposes to complete the final design and bidding services for a not-to-exceed fixed fee of \$73,500.

Additional easement description or acquisition services, if required and/or identified as a part of final design, are not included in the above work.



BOLTON & MENK, INC.

Because the consultant does not have direct control over the construction contractor's operations or schedule, our construction observation and administration services are provided on an hourly basis. Personnel rates for anticipated staffing are as follows:

Principal Engineer:	\$174 per hour
Project/Survey Manager:	\$125 per hour
Project Surveyor:	\$112 per hour
Construction Observer:	\$114 per hour
Engineering Technician:	\$98 per hour

If you find this proposal satisfactory, your signature of this proposal will constitute acceptance of the terms outlined and your authority for us to proceed. Please call if you wish to discuss this proposal. We look forward to providing these professional engineering services to you on this project and appreciate your consideration of Bolton & Menk, Inc.

Sincerely,

BOLTON & MENK, INC.



Marcus A. Thomas, P.E.
Principal Engineer



Sarah E. Rippke, P.E.
Project Manager

Signed

Date

Printed Name



DATE: October 10, 2014

TO: Edina
Ross Bintner - Environmental Engineer
7450 Metro Blvd
Edina MN, 55439

FROM: Matt Gsellmeier, MCES I&I Grant Administrator

SUBJECT: 2014 Municipal Grant Program Letter of Intent

Thank you for applying to the 2014 State Bond Funded Municipal I&I Grant Program. This non-binding letter of intent confirms receipt of your city's application and approval to participate per the Metropolitan Council's approved program design and guidelines.

The program design and guideline details, along with the draft agreement that must be entered into with the Metropolitan Council, can be found at the following link:

[http://www.metrocouncil.org/Wastewater-Water/Funding-Finance/Rates-Charges/MCES-Inflow-and-Infiltration-\(I-I\)-Program.aspx](http://www.metrocouncil.org/Wastewater-Water/Funding-Finance/Rates-Charges/MCES-Inflow-and-Infiltration-(I-I)-Program.aspx)

Based upon your application's preliminary project description and projected cost estimates, your estimated Preliminary Minimum Allocation (PMA) is \$25,000.00. Enclosed is a listing of all participating cities identifying both PMA and the estimated Final Reimbursement Amount (FRA) for each.

Please be advised that these are preliminary non-binding estimates and that each participant's final FRA depends upon the actual and eligible project work submitted per approved guidelines. PMA and FRA will be calculated simultaneously for all participants upon receipt of documentation verifying a project costs. Should a city not complete a project with I&I eligible work, or complete with insufficient eligible work, PMA and FRA will be adjusted accordingly. Contingent upon availability of funding, cities may be eligible for additional funding should they complete a project(s) with more I&I eligible work than described in their application.

Important Dates to Remember

MCES provide cities Letter of Intent, PMA & estimated FRA	October 10, 2014
Cities provide descriptions and pay claims for completed projects	October 30, 2016
FRA determination, grant agreements distributed	November 15, 2016

MCES will process reimbursement upon receipt of signed agreement and commits to sending semi-annual grant notices to all participants beginning April 2015. These notices will serve as both reminders of participation and solicitations for changes in participant contact, projects, or other relevant information.

MCES 2014 I&I Pre-Grant Application Summary
10/10/2014

City	Total Project Work:	Amt Eligible for Funding:	Est. Part 1 PMA	Remaining Balance:	Est. Part 2 Funding	Estimated FRA
Arden Hills	\$ 652,500.00	\$ 168,750.00	\$ 25,000.00	\$ 143,750.00	\$ 12,295.31	\$ 37,295.31
Bloomington	\$ 257,100.00	\$ 87,750.00	\$ 25,000.00	\$ 62,750.00	\$ 5,367.17	\$ 30,367.17
Brooklyn Center	\$ 1,684,093.60	\$ 437,793.40	\$ 25,000.00	\$ 412,793.40	\$ 35,307.28	\$ 60,307.28
Chanhassen	\$ 400,000.00	\$ 181,250.00	\$ 25,000.00	\$ 156,250.00	\$ 13,364.46	\$ 38,364.46
Columbia Heights	\$ 879,800.00	\$ 260,275.00	\$ 25,000.00	\$ 235,275.00	\$ 20,123.68	\$ 45,123.68
Deephaven	\$ 94,280.00	\$ 47,140.00	\$ 25,000.00	\$ 22,140.00	\$ 1,893.69	\$ 26,893.69
Egan	\$ 702,412.00	\$ 187,059.25	\$ 25,000.00	\$ 162,059.25	\$ 13,861.35	\$ 38,861.35
Eden Prarie	\$ 878,350.00	\$ 439,175.00	\$ 25,000.00	\$ 414,175.00	\$ 35,425.45	\$ 60,425.45
Edina	\$ 7,465,000.00	\$ 1,895,000.00	\$ 25,000.00	\$ 1,870,000.00	\$ 159,945.92	\$ 184,945.92
Excelsior	\$ 163,045.00	\$ 44,278.50	\$ 25,000.00	\$ 19,278.50	\$ 1,648.94	\$ 26,648.94
Forest Lake	\$ 940,000.00	\$ 260,000.00	\$ 25,000.00	\$ 235,000.00	\$ 20,100.16	\$ 45,100.16
Fridley	\$ 645,000.00	\$ 161,250.00	\$ 25,000.00	\$ 136,250.00	\$ 11,653.81	\$ 36,653.81
Golden Valley	\$ 1,620,895.00	\$ 439,467.50	\$ 25,000.00	\$ 414,467.50	\$ 35,450.47	\$ 60,450.47
Greenwood	\$ 42,000.00	\$ 21,000.00	\$ 21,000.00	\$ -	\$ -	\$ 21,000.00
Hopkins	\$ 425,000.00	\$ 120,000.00	\$ 25,000.00	\$ 95,000.00	\$ 8,125.59	\$ 33,125.59
Lakeville	\$ 259,676.00	\$ 82,606.00	\$ 25,000.00	\$ 57,606.00	\$ 4,927.19	\$ 29,927.19
Lilydale	\$ 450,000.00	\$ 90,000.00	\$ 25,000.00	\$ 65,000.00	\$ 5,559.62	\$ 30,559.62
Lino Lakes	\$ 226,000.00	\$ 74,500.00	\$ 25,000.00	\$ 49,500.00	\$ 4,233.86	\$ 29,233.86
Little Canada	\$ 72,000.00	\$ 26,000.00	\$ 25,000.00	\$ 1,000.00	\$ 85.53	\$ 25,085.53
Long Lake	\$ 667,000.00	\$ 181,750.00	\$ 25,000.00	\$ 156,750.00	\$ 13,407.23	\$ 38,407.23
Maple Grove	\$ 2,290,000.00	\$ 582,500.00	\$ 25,000.00	\$ 557,500.00	\$ 47,684.41	\$ 72,684.41
Maplewood	\$ 112,770.00	\$ 28,192.50	\$ 25,000.00	\$ 3,192.50	\$ 273.06	\$ 25,273.06
Medina	\$ 223,075.00	\$ 58,243.75	\$ 25,000.00	\$ 33,243.75	\$ 2,843.42	\$ 27,843.42
Mendota Heights	\$ 180,000.00	\$ 50,000.00	\$ 25,000.00	\$ 25,000.00	\$ 2,138.31	\$ 27,138.31
Minneapolis	\$ 5,098,821.00	\$ 1,274,705.25	\$ 25,000.00	\$ 1,249,705.25	\$ 106,890.51	\$ 131,890.51
Mnetonka	\$ 204,970.00	\$ 58,922.50	\$ 25,000.00	\$ 33,922.50	\$ 2,901.48	\$ 27,901.48
Mnetonka Beach	\$ 11,000.00	\$ 5,000.00	\$ 5,000.00	\$ -	\$ -	\$ 5,000.00
Mound	\$ 293,895.00	\$ 73,473.75	\$ 25,000.00	\$ 48,473.75	\$ 4,146.08	\$ 29,146.08
Mounds View	\$ 1,009,000.00	\$ 255,500.00	\$ 25,000.00	\$ 230,500.00	\$ 19,715.26	\$ 44,715.26
New Hope	\$ 427,900.00	\$ 144,975.00	\$ 25,000.00	\$ 119,975.00	\$ 10,261.77	\$ 35,261.77
Newport	\$ 698,635.00	\$ 271,938.75	\$ 25,000.00	\$ 246,938.75	\$ 21,121.31	\$ 46,121.31
North St. Paul	\$ 1,551,000.00	\$ 392,750.00	\$ 25,000.00	\$ 367,750.00	\$ 31,454.60	\$ 56,454.60
Oakdale	\$ 140,000.00	\$ 43,500.00	\$ 25,000.00	\$ 18,500.00	\$ 1,582.35	\$ 26,582.35
Prior Lake	\$ 351,000.00	\$ 87,750.00	\$ 25,000.00	\$ 62,750.00	\$ 5,367.17	\$ 30,367.17
Ramsey	\$ 63,000.00	\$ 25,250.00	\$ 25,000.00	\$ 250.00	\$ 21.38	\$ 25,021.38
Roseville	\$ 4,050,000.00	\$ 822,500.00	\$ 25,000.00	\$ 797,500.00	\$ 68,212.23	\$ 93,212.23
Saint Paul	\$ 1,079,646.30	\$ 407,411.58	\$ 25,000.00	\$ 382,411.58	\$ 32,708.65	\$ 57,708.65
Savage	\$ 118,200.00	\$ 43,425.00	\$ 25,000.00	\$ 18,425.00	\$ 1,575.94	\$ 26,575.94
Shorewood	\$ 210,000.00	\$ 56,250.00	\$ 25,000.00	\$ 31,250.00	\$ 2,672.89	\$ 27,672.89
St Anthony Village	\$ 750,000.00	\$ 194,225.00	\$ 25,000.00	\$ 169,225.00	\$ 14,474.25	\$ 39,474.25
St. Paul Park	\$ 396,957.00	\$ 99,239.25	\$ 25,000.00	\$ 74,239.25	\$ 6,349.87	\$ 31,349.87
Tonka Bay	\$ 130,000.00	\$ 32,500.00	\$ 25,000.00	\$ 7,500.00	\$ 641.49	\$ 25,641.49
Vadnais Heights	\$ 160,000.00	\$ 41,250.00	\$ 25,000.00	\$ 16,250.00	\$ 1,389.90	\$ 26,389.90
Waconia	\$ 1,141,000.00	\$ 295,500.00	\$ 25,000.00	\$ 270,500.00	\$ 23,136.56	\$ 48,136.56
Wayzata	\$ 415,800.00	\$ 103,950.00	\$ 25,000.00	\$ 78,950.00	\$ 6,752.80	\$ 31,752.80
West St. Paul	\$ 1,191,083.00	\$ 304,295.75	\$ 25,000.00	\$ 279,295.75	\$ 23,888.88	\$ 48,888.88
Woodbury	\$ 292,900.00	\$ 118,750.00	\$ 25,000.00	\$ 93,750.00	\$ 8,018.68	\$ 33,018.68
Total Amt Eligible for Funding:	\$ 41,114,803.90	\$ 11,077,042.73	\$ 1,151,000.00	\$ 9,926,042.73	\$ 849,000.00	\$ 2,000,000.00

Calculations:

Total Grant Funding	\$ 2,000,000.00
- Part 1 Funding:	\$ 1,151,000.00
= Remaining for Part 2:	\$ 849,000.00

Total Amt Eligible for Funding:	\$ 11,077,042.73
- Part 1 Funding:	\$ 1,151,000.00
= Remaining Amt Eligible	\$ 9,926,042.73

Acronyms:

Est. - Estimated
PMA - Preliminary Minilal Allocation
FRA - Estimated Final Reimbursement Amount

% Allocation for Part 2 (A)/(B) 8.6%

Technical Memorandum

To: Mr. Ross Bintner
From: Dan Nesler and Brian LeMon
Subject: WTP #4 Sewer Analysis
Date: February 27, 2015
Project: 23/27-1331
c:

Background

Over the past 10 years, one of the sanitary sewers in the northwest part of the City down stream of Water Treatment Plant #4 (WTP #4) has backed up into some homes in the area on several occasions. Backups have been reported at 300, 301, 302, and 305 Harrison Ave S and 6655 2nd Ave S. The limits of this study along with the location of the sewer experiencing the backups and the homes affected are shown on Figure #1. These backups are all in an area downstream from WTP #4, which is located in the northwest corner of Edina, near the intersection of 2nd Street and Van Buren, in Alden Park.

WTP #4 includes a filter backwash system that feeds into a recycle basin. Backwash water is pumped to the basin where solids are allowed to settle. Two pumps are installed in the recycle basin, one that pumps clear water from a floating intake back to the treatment plant for reuse and one for pumping of settled sludge and solids from the bottom of the tank to waste. The sludge pumped from the recycle tank is discharged to an air gap manhole. From this point it is pumped from the air gap manhole to the sanitary sewer.

Downstream of the pipe that receives sludge from WTP #4 is another area of concern. The City has noted that there is a section of 9-inch vitrified clay pipe (VCP) sanitary sewer that runs along the north side of Mirror Lake (north of Interlachen Blvd and west of Blake Rd S) that has reduced capacity due to being lined with a smaller 6-inch high density polyethylene (HDPE) pipe. No specific backup locations were identified in this area, but the City is concerned about the potential for backups due to the reduced size of the pipe and the intermittent high flows introduced by the sludge pumping from WTP #4.

The objective of this memorandum is to identify the primary factors contributing to the sanitary sewer backups identified earlier and then, in the context of the other data available for this section of pipe, identify improvements that will reduce the likelihood of future backups. To do this the memorandum includes:

- A summary of a field investigation of the WTP #4 discharge to the sewer completed in 2009
- Estimates of flows to the sanitary sewer in this area using the City's sanitary sewer model

To: Mr. Ross Bintner
From: Dan Nesler and Brian LeMon
Subject: WTP #4 Sewer Analysis
Date: February 27, 2015
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- An evaluation of the remaining sewer capacity, and
- Options and cost estimates of infrastructure improvements to reduce the risk of future backups.

Summary of Previous Work

In February 2009 Barr completed a brief review WTP #4 infrastructure and sanitary sewer downstream of the WTP #4 backwash recycle sludge discharge. The area studied is shown in Figure 2. As noted earlier, part of the WTP #4 infrastructure includes a backwash recycle basin. Backwash water is pumped to the recycle basin and allowed to settle. Two pumps are installed in the recycle basin, one which pumps clear water from a floating intake back to the treatment plant for reuse and one for pumping of settled sludge and solids from the bottom of the tank. The sludge and solids are pumped from the recycle tank to an air gap manhole. The sludge is then pumped from the air gap manhole to the sanitary sewer.

The WTP #4 air gap manhole pump discharges into sanitary sewer manhole 1325. The sanitary sewer then flows by gravity to the east for approximately 500-ft to MH 1327. These pipes are 9-inch VCP, were installed in 1950s and are in poor condition based on televising reports provided by the City (Attachment 1). Numerous sags, blockages, and cracked joints were noted. These two sections of pipe are also located near, or possibly underneath homes on the south side of 2nd Ave S, not in the street ROW as indicated by City records. This is not a desirable location for the pipes. Any repairs work would require access to pipe on the private yards and near the existing residential structures. The sanitary sewer then heads south to MH 1315. The existing pipes are again 9-in VCP, were installed in 1950s and are in poor condition. MH 1325 was the furthest downstream portion of the system reviewed as a part of the investigation. Note that both sections of pipe noted above included areas that were laid with minimal slope. In addition to this, numerous root intrusions were also noted.

As-built plans and information on the recycle basins at WTP #4 were also reviewed (Attachment 2). The plans and specifications call for a 50-gpm pump to convey water from the air gap manhole to the sanitary sewer MH 1325. On February 26, 2009 the City initiated a back wash tank recycle which resulted in discharge from the recycle tank to the sanitary sewer. Barr staff were onsite for portions of the discharge to monitor pumping from the air gap manhole and visually observe the flow in the sanitary sewer manholes downstream of the WTP #4 discharge.

The backwash recycle process lasted approximately 26 hours. During that time, surcharging was observed in all manholes in the study area. MHs 1325 and 1314 surcharged above the crown of the pipes. The pumping rate from the air gap manhole was estimated by measuring the change in elevation in the tank over the time of discharge. Flow rates from the air gap manhole pump were estimated to be 120-150 gpm, significantly higher than the flowrate called for in the specifications. No backups of the sanitary sewer were reported during the backwash cycle. Samples of the discharge from the air gap manhole

pump were also taken. At the beginning of the test, water was clear with little to no solids. By the end of the test discharge water was very turbid and contained a significant amount of solids. Discharge samples are shown in Figure 3.

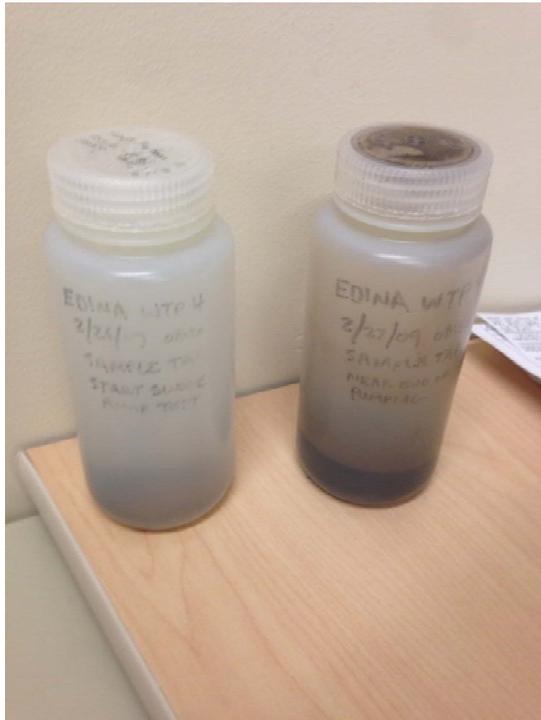


Figure 3 – Samples from early and late in the backwash recycle discharge collected from air gap manhole

Based on the investigation, it was concluded that due to the poor condition of and low slopes in the existing pipe, the sanitary sewer downstream of WTP #4 had an actual capacity somewhere near 150-gpm. With the air gap manhole pump discharging 150-gpm, plus additional base flow from the residences, normal flows could exceed the capacity of the sewer and lead to backups. The thick sludge observed during the end of the discharge cycle is also likely contributing to the reduced capacity of the sewer. At that time three options for improvements were given to the City:

- Installing a VFD on the air gap manhole pump to reduce pump speed, and in turn reduce the discharge rate to the sanitary sewer,
- Install a valve to throttle the pump discharge to a lower rate
- Consider directing the discharge from the air gap manhole to a different sanitary sewer manhole where pipe capacity is greater.

To: Mr. Ross Bintner
From: Dan Nesler and Brian LeMon
Subject: WTP #4 Sewer Analysis
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Sanitary Sewer Modeling

Previous work related to the City's sanitary sewer included the development of a computer-based sanitary sewer system model. The City's sanitary sewer model was created in 2006 as a part of an effort to analyze system capacity under various development scenarios and to help prioritize projects to reduce inflow and infiltration to the sanitary sewer. In 2013, the model was recalibrated based on historic sanitary sewer flows from 2006-2012 (*Sanitary Sewer Model Recalibration*, Barr Nov. 2013). For the current analysis, the recalibrated model was used to identify existing pipe capacity for each pipe segment within the study area. Results for the modeling are shown in Figure 4 and Table 1. The existing conditions model run assumed that WTP #4 is discharging 150 gpm from the air gap manhole. Model results indicate that all of the existing 6-inch diameter pipe near Mirror Lake is predicted to surcharge, and some pipes near the discharge of WTP #4 are nearing capacity. The model does not include reduced capacity to account for the sags, roots, and other flow impediments present in the actual system, thus it is not predicting the surcharging that was been observed in the field in 2009.

For use in evaluating improvements options, an additional model run was completed. In this model run pipe segments G-1782, 1783, 1784, 1772, 1773, 1774, 1948, 1949, 1950, 1951, 1290, and 1291 (Improvement areas 1 and 3) were all assumed to have been replaced and increased in size to 10-inch diameter PVC pipe. Results for this model run are shown in Figure 5 and Table 1. Model results indicate that all capacity and surcharge problems have been resolved and all pipes have greater than 50% of their theoretical capacity remaining even with the WTP #4 discharge at 150 gpm.

Sewer Televising

Over the course of the past few years, the City has televised most of the sanitary sewer in the study area. The City provided Barr with copies of the televising reports that were available. The reports were reviewed to determine the condition of the pipes and to aid in deciding if sections of pipe in the study area should be replaced. The videos were reviewed for general overall condition of the pipe. If significant (greater than 3") sags, roots, offset joints or cracks were observed a pipe was labeled as deteriorated. If no major issues were observed, a pipe was labeled as adequate. For pipes where no televising report was available, it was assumed the pipe was in poor condition and needed replacement. A summary of the pipe condition in the study area is shown in Figure 6. The original sewer televising reports are included in Attachment 1.

Conceptual Improvement Options and Costs

Based on the televising reports, modeling of the existing sanitary sewer, and field observed conditions, three portions of the study area were identified for needing improvements:

To: Mr. Ross Bintner
From: Dan Nesler and Brian LeMon
Subject: WTP #4 Sewer Analysis
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- Area 1 - MH 1325 to MH1315 (near the WTP #4 discharge)
- Area 2 – MH 1319 to MH 1376 (green space between Tyler Ct. and Arthur St.)
- Area 3 – MH 1364 to MH 1759 (near Mirror Lake)

Area 1

In Area 1, surcharging and back-ups have been reported, the televising reports showed the pipe is in a deteriorated condition, and the sanitary sewer model is showing some pipes nearing capacity. In addition to this some sections of pipe are actually located beneath homes in the area which is highly undesirable. Area 1 is shown in Figure 7. Two options were identified for improvements to the sanitary sewer in Area 1.

Option 1A is to replace the existing 9-inch VCP pipe with a 10-inch PVC pipe by open cut methods. Currently the existing pipe is located underneath the homes along 2nd Ave S. The new pipe would be located in the right of way of 2nd Ave S and the existing pipe would be abandoned in place. The new pipe would allow for increased capacity in the area over the current pipe and greatly reduce the likelihood of backups from the WTP #4 discharge. A conceptual level cost estimate for Option 1A is shown in Table 2 and a cost breakdown is included in Attachment 3.

Option 1B is to line the existing 9-inch VCP pipe with a cast in place pipe (CIPP) and install a new forcemain from the air gap manhole south from WTP #4 to a different area of the sanitary sewer. Lining of the existing pipe downstream of WTP #4 and redirecting the flow to a different area would reduce the chances for backups near WTP #4. However lining of the existing pipe will not correct the low slopes/sags in the pipe and the pipe will still be located underneath the homes on the south side of 2nd Ave S. A conceptual level cost estimate for Option 1B is shown in Table 2 and a cost breakdown is included in Attachment 3.

Area 2

In Area 2 no sanitary sewer backups are known to have occurred. The pipes in this area were unable to be televised by the City and their condition is unknown. As such, to be conservative, their condition has been assumed to be deteriorated and in need up repair. Two options were identified for improvements to the sanitary sewer in Area 2. Area 2 is shown in Figure 7.

Option 2A is to replace the existing 9-inch VCP pipe with a 10-inch PVC pipe by open cut methods. Currently the existing pipe is located in the yards of homes between Tyler Ct and Arthur St. The new pipe would be installed along the same alignment. The new pipe would be an improvement over the possibly deteriorated condition of the current pipe and decrease the likelihood of future backups from in the area.

To: Mr. Ross Bintner
From: Dan Nesler and Brian LeMon
Subject: WTP #4 Sewer Analysis
Date: February 27, 2015
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A conceptual level cost estimate for Option 2A is shown in Table 2 and a cost breakdown is included in Attachment 3.

Option 2B is to line the existing 9-inch VCP pipe with CIPP. Lining of the existing pipe would reduce any inflow and infiltration into the pipe and improve the flow characteristics of the pipe. However lining of the existing pipe will not correct any low slopes or sags that may exist in the pipe. A conceptual level cost estimate for Option 2B is shown in Table 2 and a cost breakdown is included in Attachment 3.

Area 3

In Area 3, no sewer backups are known to have occurred. However, when inspecting the sewers in the area debris was observed all the way up to the rim of the manhole. This debris indicates surcharging has occurred in the area. City records indicate that this section of sewer is 9-inch VCP. However it was confirmed during the field visit that the sewer between MH 1364 and 1759 has been slip lined with a 6-inch HDPE pipe (Figure 6). It was also noted that the manholes in Area 3 near Mirror Lake are close to the water edge. A review of the City's storm water model indicated that the predicted 100-yr storm elevation of Mirror Lake in this area is 912.1. This elevation is close to the rim elevation of the existing manholes and well above the invert elevation of the sewer. Area 3 is shown in Figure 7.



Figure 8 - 6-inch HDPE Liner

Replacement was the only option identified for improvements to the sanitary sewer in Area 3. Based on the modeling completed, the existing 6-inch pipe will not handle the predicted flows so CIPP is not an option for this area. Pipe bursting was considered, but based on conversations with local contractors, it is not believed to be feasible to burst both the 6-inch HDPE and the 9-inch VCP to install a larger pipe. Replacement of the existing pipe was assumed to be with a 10-inch PVC pipe by open cut methods.

To: Mr. Ross Bintner
From: Dan Nesler and Brian LeMon
Subject: WTP #4 Sewer Analysis
Date: February 27, 2015
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Currently the existing pipe is located in the backyards of homes and land owned by the City. The new pipe would be installed along the same alignment. The new pipe would be an improvement over the undersized pipe currently in place and decrease the likelihood of backups from in the area. Reconstruction of the sewer in this area would also allow for manhole rims to be raised and sealed, to minimize the risk of inflow from Mirror Lake to the sanitary sewer. A conceptual level cost estimate for Option 3A is shown in Table 2 and a cost breakdown is included in Attachment 3.

Summary and Recommendations

The sections of pipe reviewed were all installed in the mid 1950's to 1960's. All are VCP which is susceptible to cracking and brittle failure in poor soil conditions. Numerous sections of the pipe that were inspected and televised showed signs of deterioration, had significant sags, were installed at low slopes and had numerous root intrusions. Discharge from WTP #4 will occur into the future and will continue to pose a threat of additional sanitary backups if pipes are left in their current condition or flowrates are not reduced. Options exist to repair and replace segments of the pipe that are in the worst condition or that are significant contributing factors to the sanitary backups. If the City undertakes options to repair and replace the deteriorated pipe the risk of future sanitary backups will be significantly reduced.

Based on discussions with the City, the City plans to complete the improvements over a period of time. It is recommended that the City prioritize improvements in Area 3 first, Area 1 second, and Area 2 third. While Area 1 is closer to WTP #4 and the previous sewer back-ups, if improvements are made here first, they may exacerbate problems in Area 3. Area 2 is prioritized last as it has no current indication of back-ups.

In the short term, it is recommended that the City look into reducing the flowrate from the air gap manhole pump. This could be accomplished by any of the below options:

- Reducing the flowrate of the existing pump by partially closing an existing valve, if one is currently installed
- Installing a valve to throttle the existing pump discharge if a valve is not currently installed
- Installation of a VFD to reduce the speed of the existing pump, and thereby reducing the flowrate
- Installation of a smaller pump

It is also recommended that the City consider further efforts to televise improvement Area 2. Local contractors (Infratech – Infrastructure Technologies, Inc.) may have smaller cameras that are able to access these pipes. If these pipes are televised and found to be in good condition they could be removed from the list of improvement areas.

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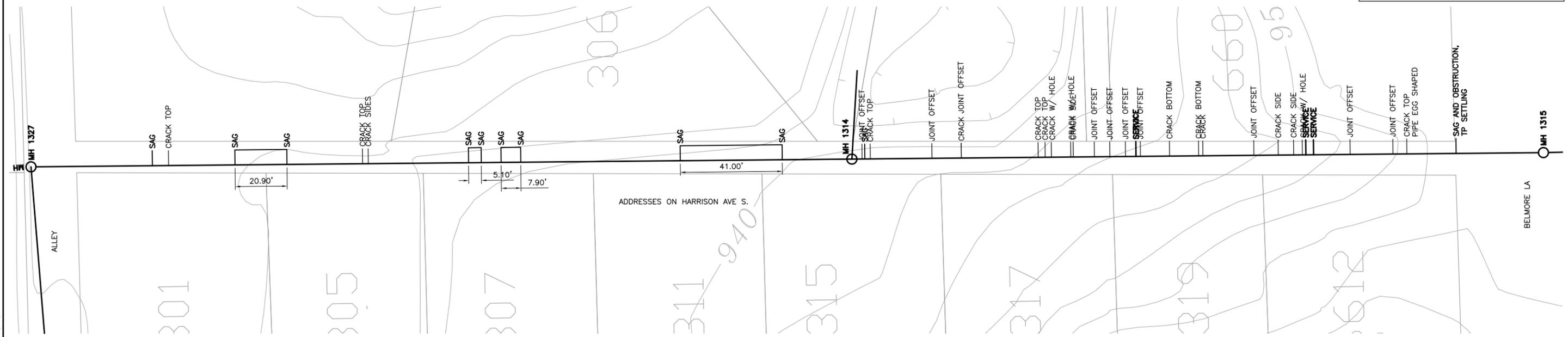
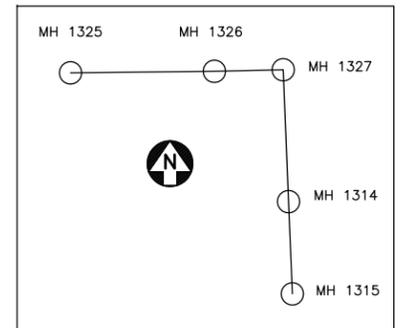


1 PLAN: MH 1325 TO MH 1327
AS SHOWN



NOTES:

1. POSITION OF MANHOLES IS APPROXIMATE, BASED ON SEWER VIDEO FEET AND VISUAL FIELD INSPECTION.
2. ROOT INTRUSIONS ARE PREVALENT ALONG ENTIRE LENGTH OF SEWER PIPES - NOT SPECIFICALLY NOTED.



2 PLAN: MH 1327 TO MH 1315
AS SHOWN



NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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.

SIGNATURE _____
 PRINTED NAME _____
 DATE _____ REG. NO. _____

CLIENT	BID	CONSTRUCTION	RELEASED TO/FOR	A	B	C	0	1	2	3	DATE RELEASED

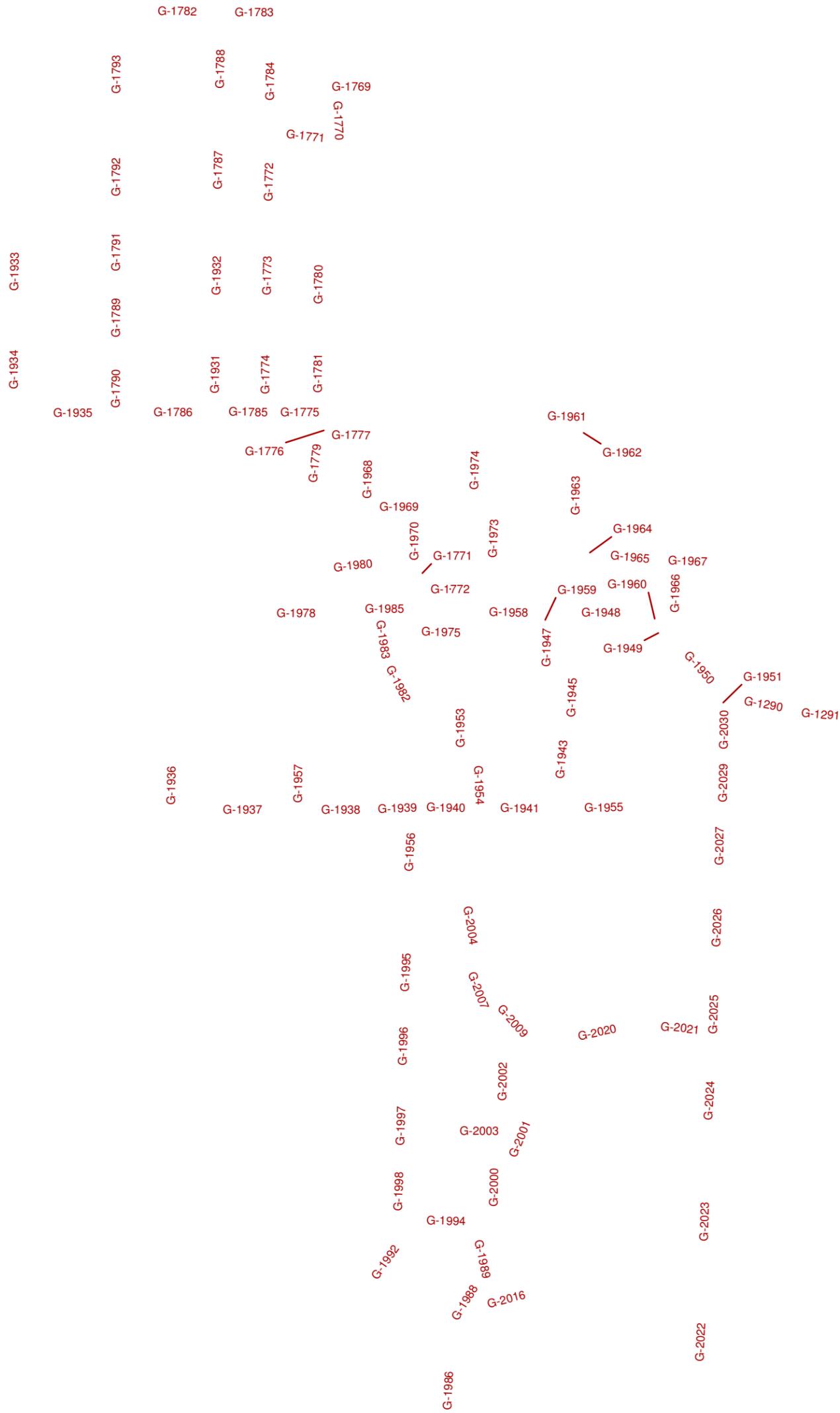
BARR
 Project Office:
 BARR ENGINEERING CO.
 4700 WEST 77TH STREET
 MINNEAPOLIS, MN.
 55435-4803
 Corporate Headquarters:
 Minneapolis, Minnesota
 Ph: 1-800-632-2277
 Fax: (952) 832-2601
 www.barr.com

Scale	AS SHOWN
Date	3/19/2009
Drawn	MAH2
Checked	
Designed	
Approved	

CITY OF EDINA
EDINA, MINNESOTA

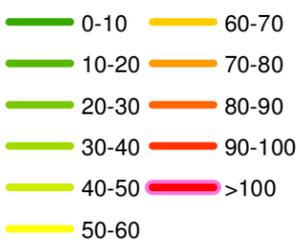
WTP #4 SANITARY DISCHARGE
 SEWER LINE TELEVISIONING REPORT
 MH 1325 TO MH 1315

BARR PROJECT No. 23/27-1029	REV. No.
CLIENT PROJECT No.	
DWG. No. Figure 2	



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Pipe Capacity (%)



-  WTP Discharge Location
-  Municipal Boundary

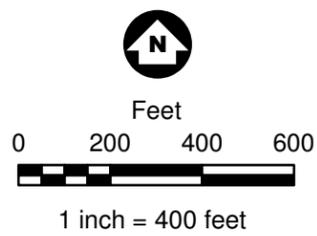
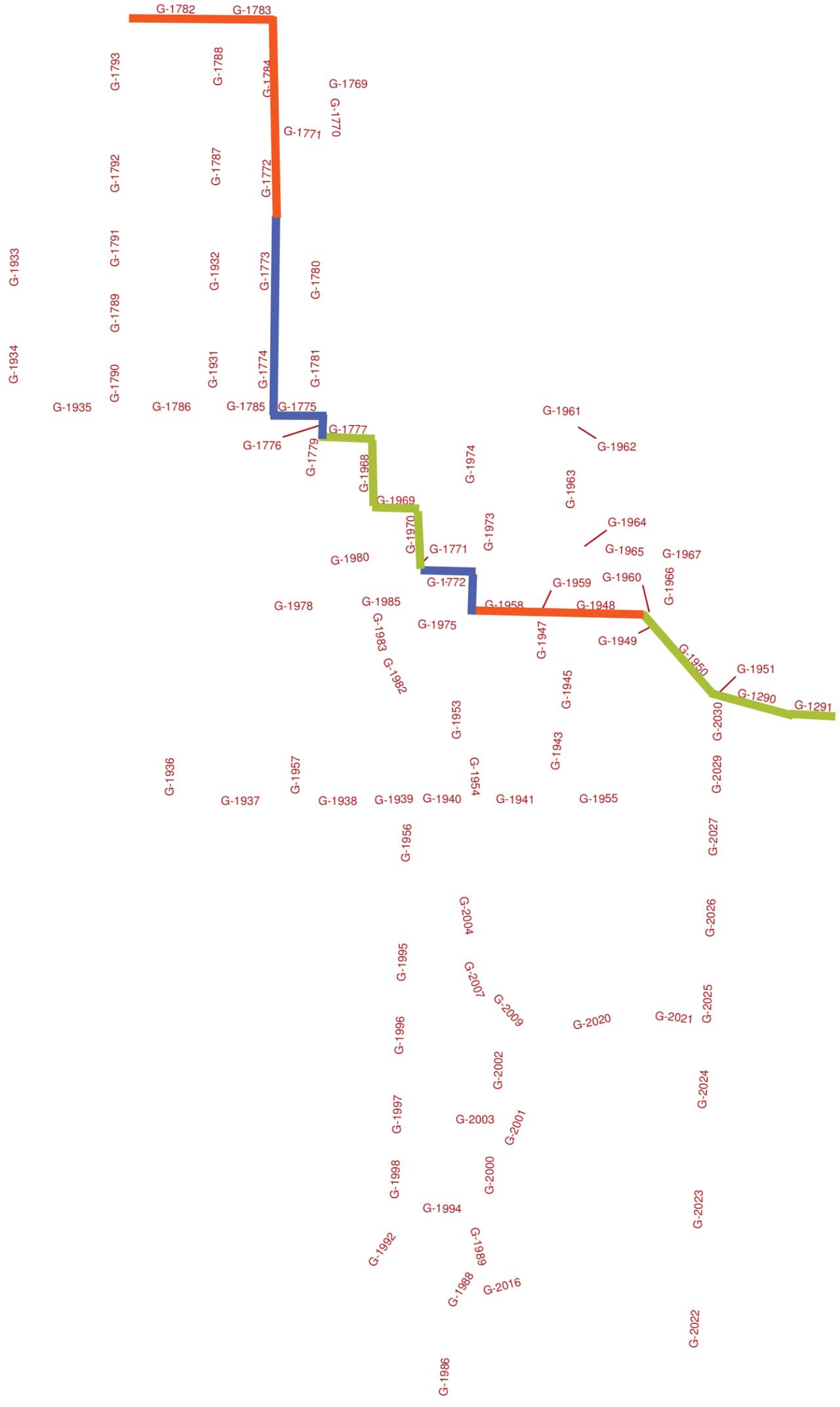


Figure 4

**SANITARY SEWER MODEL RESULTS
EXISTING CONDITIONS
City of Edina, MN**



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

-  WTP Discharge Location
-  Pipe in Adequate Condition
-  Pipe in Deteriorated Condition
-  Pipe not Televised

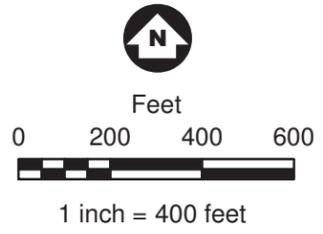
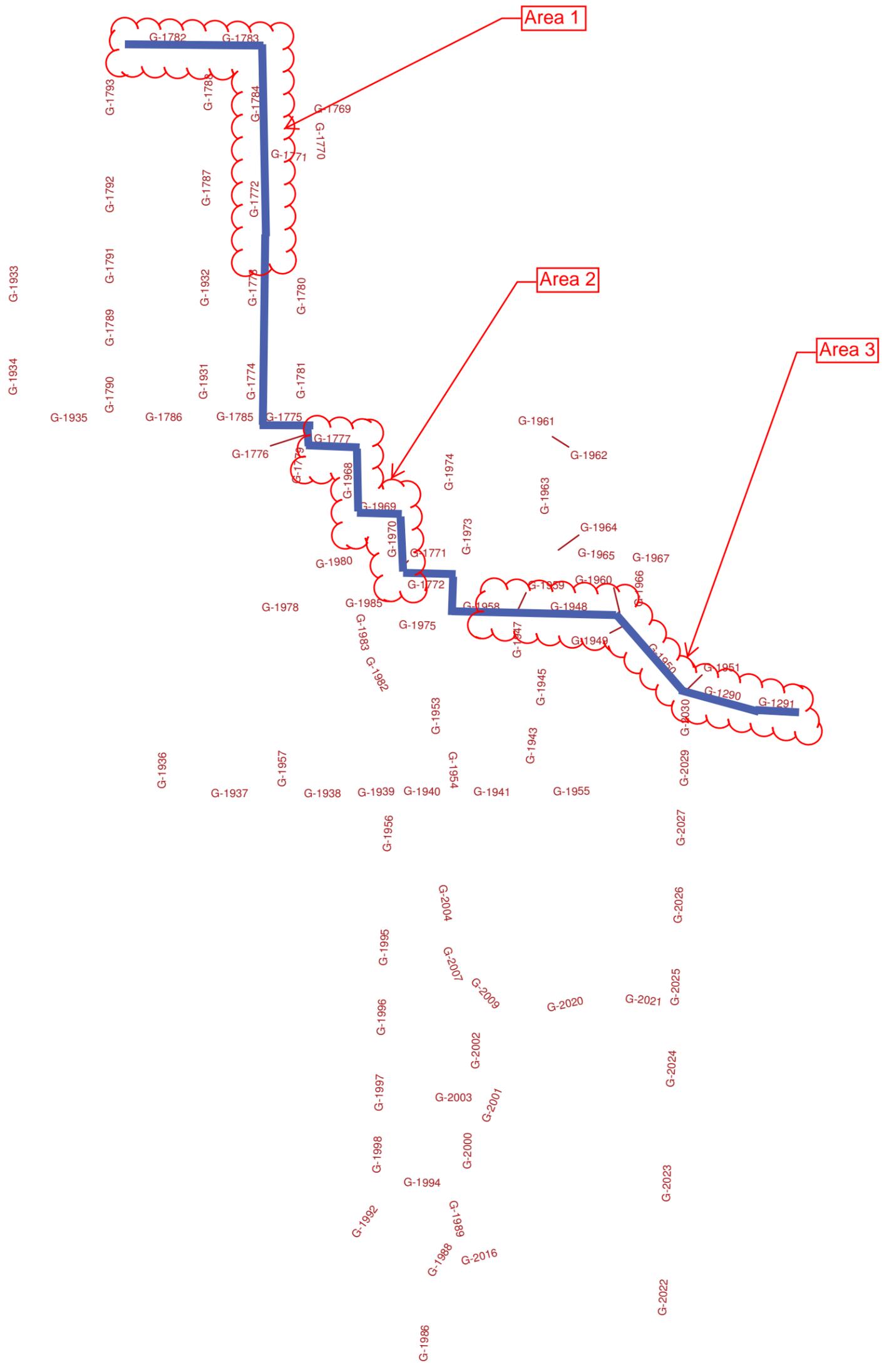


Figure 6
Sanitary Sewer Televising
City of Edina, MN



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

■ WTP Discharge Location

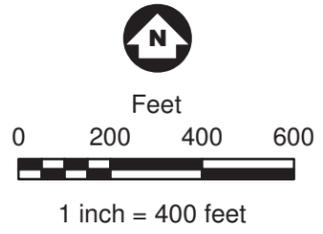


Figure 7
Improvement Areas
City of Edina, MN

PipeID	Percent Capacity (%)	
	Modeled Flow & Infiltration	
G-2348	9.2	9.2
G-2346	9.5	9.5
G-2345	0.4	0.4
G-2344	0.4	0.4
G-2343	0.4	0.4
G-2342	0.6	0.6
G-2341	0.4	0.4
G-2340	0.2	0.2
G-2339	0.6	0.6
G-2338	1.4	1.4
G-2337	1.1	1.1
G-2336	0.8	0.8
G-2335	0.4	0.4
G-2334	0.7	0.7
G-2333	0.1	0.1
G-2347	8.5	8.5
G-1309	7.7	7.7
G-1308	7.5	7.5
G-1307	3.5	3.5
G-1306	3.4	3.4
G-1305	4.3	4.3
G-1304	4.0	4.0
G-1303	5.5	5.5
G-1302	4.1	4.1
G-1301	4.4	4.4
G-1300	3.7	3.7
G-1299	2.1	2.1
G-1298	3.1	3.1
G-1297	2.7	2.7
G-1296	2.0	2.0
G-1295	1.8	1.8
G-1294	1.3	1.3
G-1293	0.9	0.9
G-1292	0.3	0.3
G-1291	130.3	33.9
G-1288	53.7	54.5
G-1287	8.1	8.1
G-1286	9.7	9.7
G-1285	29.2	29.2
G-2030	12.3	12.3
G-2029	3.4	3.4
G-2028	10.8	10.8
G-2027	10.8	10.8
G-2026	15.5	15.5
G-2024	0.5	0.5

PipeID	Percent Capacity (%)	
	Modeled Flow & Infiltration	
G-2023	0.5	0.5
G-2022	0.4	0.4
G-2025	13.8	13.8
G-2021	9.6	9.6
G-2016	0.3	0.3
G-2020	11.9	11.9
G-2014	7.6	7.6
G-2015	7.6	7.6
G-2010	0.4	0.4
G-2009	0.9	0.9
G-2008	0.7	0.7
G-2007	0.6	0.6
G-2006	0.2	0.2
G-2005	0.2	0.2
G-2004	0.1	0.1
G-2003	0.1	0.1
G-2013	6.4	6.4
G-2002	8.9	8.9
G-2001	6.8	6.8
G-1999	0.3	0.3
G-1998	0.7	0.7
G-1997	0.5	0.5
G-1996	0.6	0.6
G-1995	0.2	0.2
G-1994	0.6	0.6
G-1993	0.4	0.4
G-1992	0.3	0.3
G-1991	0.1	0.1
G-2000	5.1	5.1
G-1990	3.7	3.7
G-1989	1.0	1.0
G-1988	1.4	1.4
G-1987	0.5	0.5
G-1986	0.1	0.1
G-1984	0.1	0.1
G-1985	0.4	0.4
G-1983	0.3	0.3
G-1982	0.4	0.4
G-1981	0.3	0.3
G-1980	0.6	0.6
G-1979	0.7	0.7
G-1978	0.1	0.1
G-1976	1.4	1.4
G-1975	1.5	1.5
G-1974	0.2	0.2

PipeID	Percent Capacity (%)	
	Modeled Flow & Infiltration	
G-1973	0.4	0.4
G-1970	49.5	52.1
G-1969	43.7	46.1
G-1967	0.1	0.1
G-1966	0.5	0.5
G-1965	0.5	0.5
G-1964	0.5	0.5
G-1963	0.8	0.8
G-1962	0.4	0.4
G-1961	0.1	0.1
G-1960	0.7	0.7
G-1959	25.3	26.7
G-1977	46.1	48.6
G-1958	18.0	19.0
G-1957	0.2	0.2
G-1956	0.1	0.1
G-1955	0.4	0.4
G-1954	0.4	0.4
G-1953	0.2	0.2
G-1952	0.1	0.1
G-1290	129.2	33.6
G-1951	117.5	30.5
G-1950	112.8	29.3
G-1949	132.0	34.3
G-1948	50.4	34.0
G-1947	7.4	7.4
G-1946	7.4	7.4
G-1945	1.3	1.3
G-1944	1.1	1.1
G-1943	1.4	1.4
G-1942	3.5	3.5
G-1941	1.9	1.9
G-1940	0.5	0.5
G-1939	0.6	0.6
G-1938	1.7	1.7
G-1937	0.5	0.5
G-1936	0.3	0.3
G-1935	1.1	1.1
G-1934	0.8	0.8
G-1933	0.3	0.3
G-1931	0.3	0.3
G-1932	0.1	0.1
G-1793	0.4	0.4
G-1792	0.3	0.3
G-1790	0.3	0.3

PipeID	Percent Capacity (%)	
	Modeled Flow & Infiltration	
G-1789	0.1	0.1
G-1791	0.1	0.1
G-1788	0.4	0.4
G-1787	0.1	0.1
G-1786	2.1	2.1
G-1785	0.8	0.8
G-1784	31.2	32.9
G-1783	43.3	45.7
G-1782	40.5	42.8
G-1781	0.2	0.2
G-1780	0.2	0.2
G-1779	0.2	0.2
G-1778	0.2	0.2
G-1968	43.6	45.9
G-1777	43.4	45.8
G-1776	38.9	41.0
G-1775	43.3	45.6
G-1774	39.0	41.1
G-1773	38.9	41.0
G-1772	53.2	56.1
G-1771	0.5	0.5
G-1770	0.3	0.3
G-1769	0.4	0.4
G-1768	0.8	0.8
G-1767	0.3	0.3
G-1766	0.3	0.3
G-1764	0.5	0.5
G-1763	0.5	0.5
G-1762	0.2	0.2
G-1761	0.1	0.1
G-1760	0.8	0.8
G-1759	0.2	0.2
G-1765	4.2	4.2
G-1758	0.9	0.9
G-1757	7.3	7.3
G-1756	0.1	0.1
G-1755	0.2	0.2
G-1754	0.1	0.1
G-1753	0.6	0.6
G-1752	0.3	0.3
G-1751	0.6	0.6
G-1750	0.3	0.3
G-1749	2.6	2.6
G-1748	1.0	1.0
G-1747	1.2	1.2

PipeID	Percent Capacity (%)	
	Modeled Flow & Infiltration	
G-1746	0.3	0.3
G-1745	19.4	19.4
G-1744	15.2	15.2
G-1743	14.9	14.9
G-1742	14.3	14.3
G-1741	14.4	14.4
G-1740	11.2	11.2
G-1739	9.8	9.8
G-1736	5.4	5.4
G-1735	0.4	0.4
G-1734	0.3	0.3
G-1733	0.8	0.8
G-1732	0.3	0.3
G-1737	9.7	9.7
G-1731	2.9	2.9
G-1730	2.6	2.6
G-1729	1.5	1.5
G-1728	1.1	1.1
G-1727	1.0	1.0
G-1726	0.3	0.3

**Table 2. Conceptual Level Cost Estimates
WTP #4 Sewer Analysis - City of Edina, MN**

Option #	Estimated Cost
1A	\$ 720,000
1B	\$ 920,000
2A	\$ 410,000
2B	\$ 440,000
3A	\$ 690,000

Notes:

- * Conceptual level cost estimates - +100/-50%
- * Assuming good soil conditions
- * Necessary easements and access agreements acquired by City of Edina
- * Includes 25% construction contingency and 20% for engineering and administration
- * Option 1A - Replacement/relocation of sewer from MH 1325 to 1315
- * Option 1B - Rlining of sewer from MH 1325 to 1315 and new forcemain
- * Option 2A - Replacement of sewer from MH 1319 to 1376
- * Option 2B - Lining of sewer from MH 1319 to 1376
- * Option 3A - Replacement of sewer from MH 1364 to 1759

Attachment No. 1

***Sewer Televising
(electronic)***

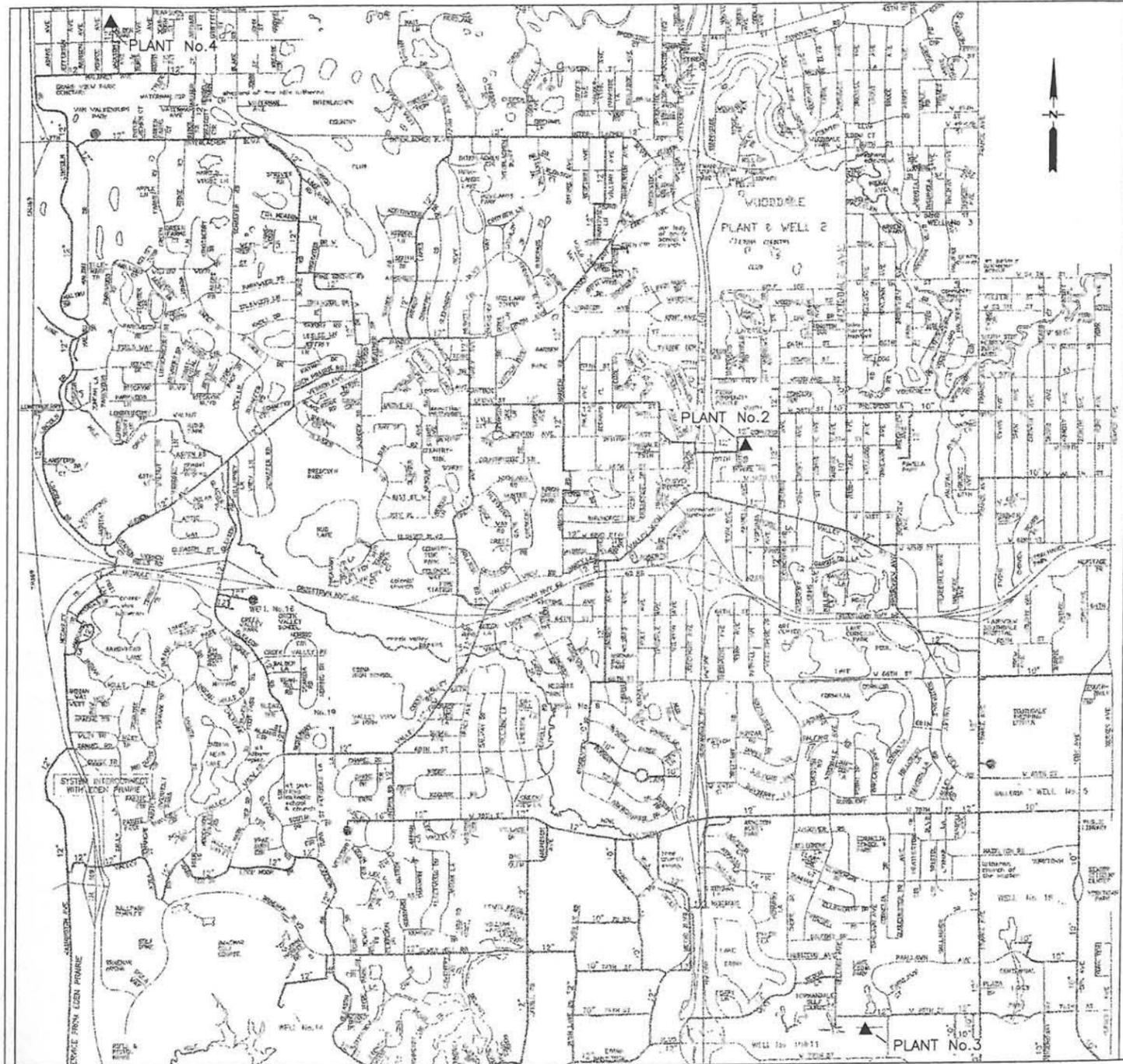
Attachment No. 2

WTP #4 Plans

DRAWINGS FOR RECYCLE BASINS AT WATER TREATMENT PLANTS No. 2, No. 3, & No. 4 EDINA, MINNESOTA

INDEX

DWG NO.	TITLE
<u>GENERAL</u>	
G1	SITE LOCATION & DRAWING INDEX
G2	WTP 2 - SITE PLAN
G3	WTP 2 - CONNECTIONS AT PLANT
G4	WTP 2 - RECYCLE BASIN PLAN
G5	WTP 2 - RECYCLE BASIN SECTIONS
G6	WTP 3 - SITE PLAN
G7	WTP 3 - CONNECTIONS AT PLANT
G8	WTP 3 - RECYCLE BASIN PLAN
G9	WTP 3 - RECYCLE BASIN SECTIONS
G10	WTP 4 - SITE PLAN
G11	WTP 4 - CONNECTIONS AT PLANT
G12	WTP 4 - RECYCLE BASIN PLAN
G13	WTP 4 - RECYCLE BASIN SECTIONS
G14	EXCAVATION PLAN
G15	DETAILS
G16	DETAILS
<u>ARCHITECTURAL</u>	
A1	DEMOLITION AND FLOOR PLANS
A2	ROOF PLAN AND DETAILS
A3	BUILDING ELEVATIONS AND WALL SECTION
A4	BUILDING SECTION AND WALL SECTION
A5	INTERIOR ELEVATIONS AND DETAILS
A6	ENLARGED DETAILS AND SCHEDULES
A7	ENLARGED DETAILS
<u>STRUCTURAL</u>	
S1	GENERAL NOTES
S2	WATER TREATMENT PLANT NO. 2 - FOUNDATION PLAN
S3	WATER TREATMENT PLANT NO. 2 - ROOF FRAMING PLAN
S4	WATER TREATMENT PLANT NO. 3 - FOUNDATION PLAN
S5	WATER TREATMENT PLANT NO. 3 - ROOF FRAMING PLAN
S6	WATER TREATMENT PLANT NO. 4 - FOUNDATION PLAN
S7	WATER TREATMENT PLANT NO. 4 - ROOF FRAMING PLAN
S8	ROOF REINFORCING PLAN & DETAILS
S9	SECTIONS
S10	SECTIONS
S11	WATER TREATMENT PLANT NO. 4 - CHEMICAL ROOM ADDITION
<u>MECHANICAL</u>	
M1	WATER TREATMENT PLANT #4-CHEMICAL ROOM ADDITION
M2	WATER TREATMENT PLANT #4-CHEMICAL ROOM ADDITION
<u>ELECTRICAL</u>	
E1	ELECTRICAL SYMBOLS & ABBREVIATIONS
E2	WATER TREATMENT PLANT #2 ELECTRICAL PLAN
E3	WATER TREATMENT PLANT #3 ELECTRICAL PLAN
E4	WATER TREATMENT PLANT #4 ELECTRICAL PLAN
E5	WATER TREATMENT PLANT #2 MCC ONE-LINE DIAGRAM AND ELEVATION
E6	WATER TREATMENT PLANT #3 MCC ONE-LINE DIAGRAM AND ELEVATION
E7	WATER TREATMENT PLANT #4 MCC ONE-LINE DIAGRAM AND ELEVATION
E8	WATER TREATMENT PLANT #2 CONTROL PANEL SCHEMATIC (PARTIAL)
E9	WATER TREATMENT PLANT #3 CONTROL PANEL SCHEMATIC (PARTIAL)
E10	WATER TREATMENT PLANT #4 CONTROL PANEL SCHEMATIC (PARTIAL)
E11	WATER TREATMENT PLANT #4 CHEMICAL ROOM ADDITION



SITE LOCATION
NO SCALE

CIVIL/PROCESS

pce PROGRESSIVE CONSULTING ENGINEERS INC. (763)560-9133 FAX: (763)560-0333 6120 EARLE BROWN DR. MINNEAPOLIS, MN. 55430

ARCHITECT

the ADKINS ASSOCIATION inc. ARCHITECTS
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10900 Noble Avenue North Champlin, Minnesota 55316 (763)560-5300 fax: (763)560-5400 www.sdneng.com Email: sda@sdneng.com

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ELECTRICAL

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pce PROGRESSIVE CONSULTING ENGINEERS INC. (763)560-9133 FAX: (763)560-0333 6120 EARLE BROWN DR. MINNEAPOLIS, MN. 55430

ISSUE	DESCRIPTION	DATE
A	ISSUE FOR BID	5/19/05
	ISSUE FOR DEPARTMENT OF HEALTH REVIEW	5/5/05

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.
SIGNATURE: *Lance E. Newman*
NAME: LANCE E. NEWMAN DATE: 5/23/05 REG No: 26192

DESIGNED:	LN
DRAWN:	BD
CHECKED:	LN
DATE:	5/19/05

City of Edina, MN
WATER TREATMENT PLANT NO. 2, 3, & NO. 4
SITE LOCATION & DRAWING INDEX

JOB NO.	ISSUE
03034	A
DRAWING NO.	G1

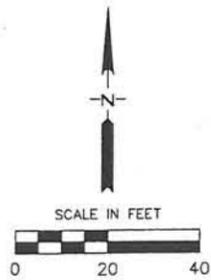
I:\dwg\pce\projects\2003\Edina\Recycle\Tanks\WTP 2 & 4\CAD DRAWINGS\ISSUE FOR BID\Edina\WTP2.dwg 05/23/05 10:47:21am

GENERAL NOTES:

1. MATCH EXISTING ELEVATION AT CONSTRUCTION LIMITS UNLESS SHOWN OTHERWISE.
2. CONTRACTOR(S) MUST FIELD VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES WHETHER SHOWN ON THE DRAWING OR NOT. LOCATIONS MUST BE ESTABLISHED IMMEDIATELY PRIOR TO CONSTRUCTION.
3. STATE LAW: 48 HOURS BEFORE EXCAVATING OR DEMOLISHING BUILDINGS, CALL 651-454-0002 FOR FIELD LOCATION OF UNDERGROUND UTILITY LINES. (This service locates utility owned lines but not private lines.)
4. ALL WORK SHALL MEET EDINA CITY STANDARDS AT A MINIMUM.
5. EXISTING WATER TREATMENT AND BACKWASH PROCESS MUST REMAIN OPERATIONAL UNTIL THE RECYCLE TANK HAS BEEN COMPLETED AND IS READY FOR OPERATION. COORDINATE WITH EDINA FOR CUT OVER TO THE NEW RECYCLE TANK.
6. ALL PIPE INSTALLED WILL BE PRESSURE TESTED PER THE SPECIFICATIONS FOR WATERMAIN AND APPURTENANCES. PROVIDE NECESSARY THRUST RESTRAINT (MECHANICAL) FOR ALL CHANGES OF PIPE DIRECTION, DEAD ENDS, FITTINGS, VALVES, ETC.

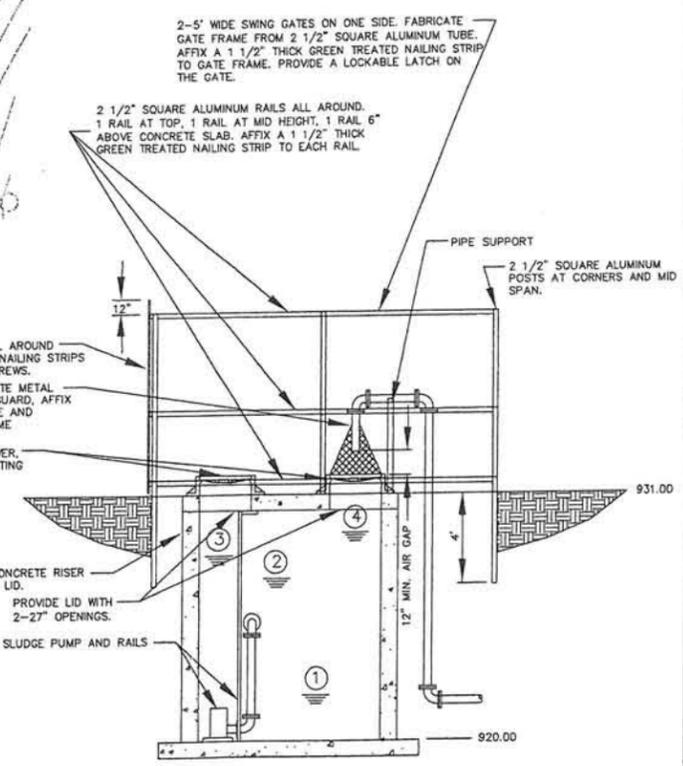
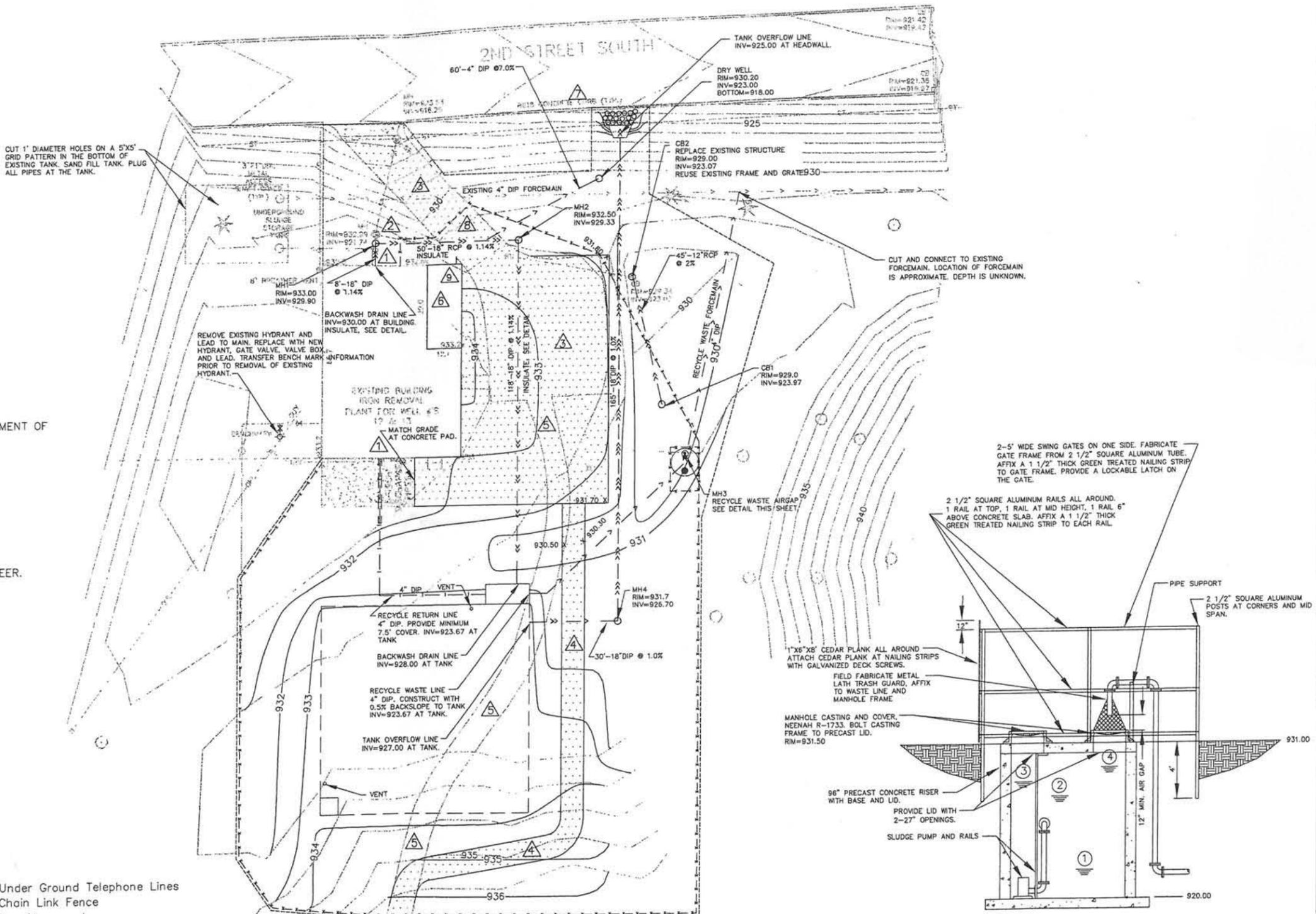
CONSTRUCTION NOTES:

1. PROTECT EXISTING FOOTINGS FROM UNDERMINING DURING BORE AND JACK OPERATIONS.
2. BULKHEAD PIPE OPENING FOR PIPE FROM THE PLANT.
3. REMOVE EXISTING SOD, TOP SOIL, PAVEMENT AND SUBGRADE, ECT. TO ALLOW PLACEMENT OF NEW PAVING SECTION TO PROPOSED LINES AND GRADES.
4. RELOCATE TRAIL AS SHOWN. CONSTRUCT NEW TRAIL PAVING SECTION PER DETAIL. CONSTRUCT WITH 2% CROSS SLOPE TO EAST SIDE.
5. COMPLETELY REMOVE EXISTING TRAIL WITHIN CONSTRUCTION LIMITS.
6. BUILDING ADDITION. SEE ARCHITECTURAL.
7. RESERVOIR OVERFLOW HEADWALL (SEE DETAIL).
8. TEMPORARY CHAIN LINK GATE WITH LOCK. PROVIDE LOCK KEY TO OWNER AND ENGINEER.
9. SEE MECHANICAL PLANS FOR CONTINUATION.



LEGEND

- | | |
|--|--|
| <ul style="list-style-type: none"> ○ Existing Light Pole ○ Existing Sanitary Sewer Manhole ○ Existing Storm Sewer Manhole □ Existing Catch Basin ○ Existing Post ○ Existing Utility Pole ○ Existing Sanitary Sewer ○ Existing Storm Sewer ○ Existing Watermain ○ Existing Gasmain ○ Existing Overhead Electric Lines ○ Existing Under Ground Electric Lines ○ Existing Overhead Telephone Lines | <ul style="list-style-type: none"> --- Existing Under Ground Telephone Lines --- Existing Chain Link Fence --- Existing Iron Monument --- Existing Contours --- Backwash Drain Line or New Storm Line --- New Sanitary Sewer line --- New Water Line --- New Gate Valve --- Construction Limits --- Construction Fence --- Tank Overflow Line --- New Bituminous Paving --- New Concrete Paving |
|--|--|



WTP #4 RECYCLE WASTE AIR GAP MANHOLE

1. AIR GAP SLUDGE PUMP SHUT OFF ELEV.=922.00
2. AIR GAP SLUDGE PUMP ON AT ELEV.=927.00
3. RECYCLE BASIN SLUDGE PUMP OFF AT ELEV.=928.00
4. HIGH LEVEL ALARM AT ELEV.=929.00

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

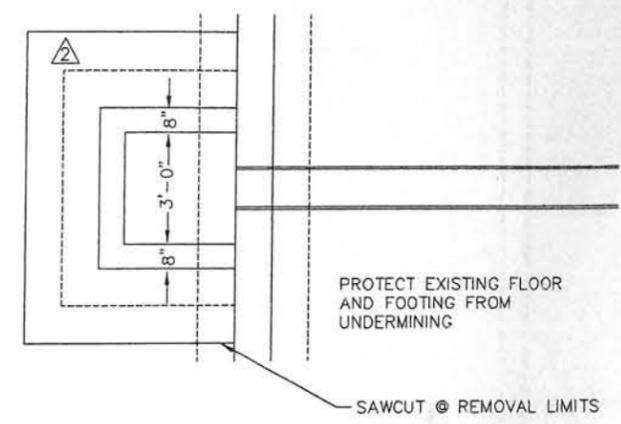
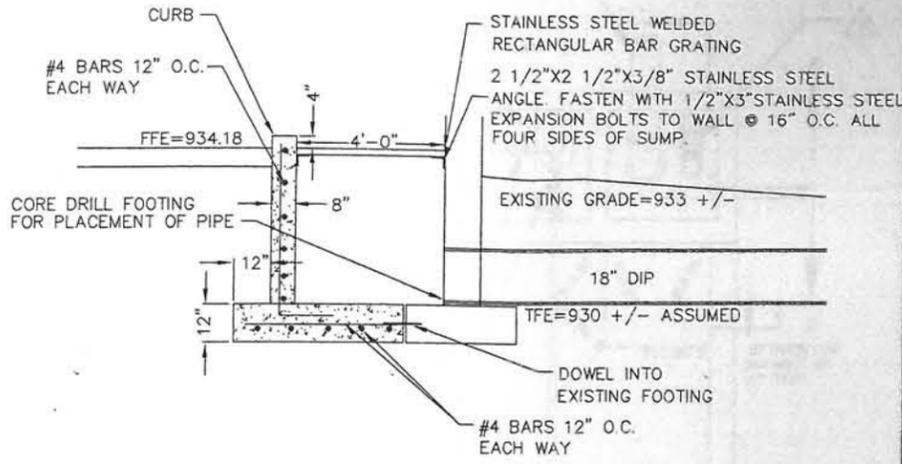
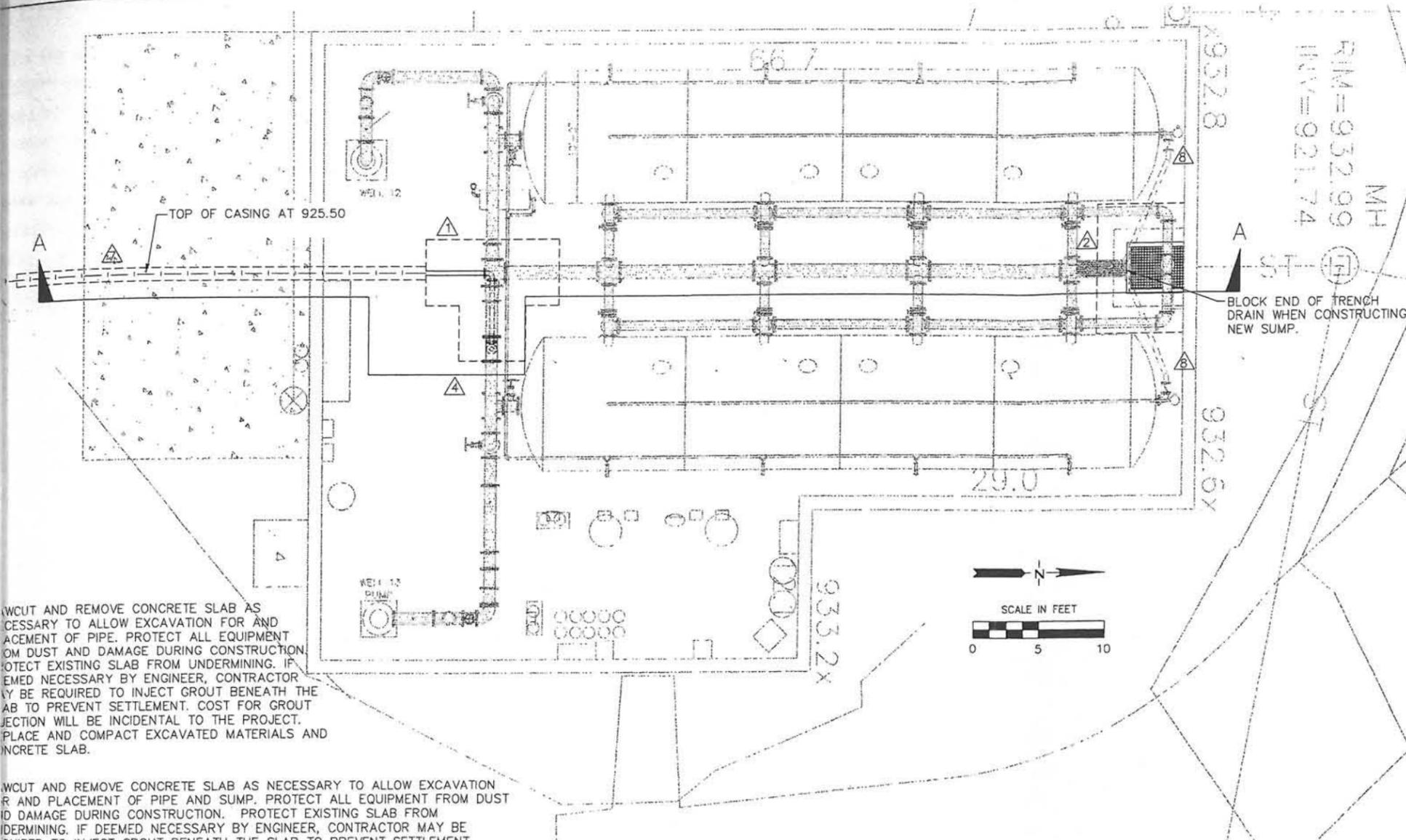
pce PROGRESSIVE CONSULTING ENGINEERS INC.
 (763)560-9133
 6120 EARLE BROWN DR. MINNEAPOLIS, MN. 55430

ISSUE	DESCRIPTION	DATE
A	ISSUE FOR BID	5/19/05
	ISSUE FOR DEPARTMENT OF HEALTH REVIEW	5/5/05

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.
 SIGNATURE: *Lance E. Newman*
 NAME: LANCE E. NEWMAN DATE: 5/20/05 REG No. 26192

DESIGNED: LN
DRAWN: BD
CHECKED: LN
DATE: 5/19/05

City of Edina, MN		JOB NO. 03034	ISSUE A
WTP 4 - SITE PLAN		DRAWING NO. G10	



SUMP DETAIL
NOT TO SCALE

WCUT AND REMOVE CONCRETE SLAB AS NECESSARY TO ALLOW EXCAVATION FOR AND PLACEMENT OF PIPE. PROTECT ALL EQUIPMENT FROM DUST AND DAMAGE DURING CONSTRUCTION. PROTECT EXISTING SLAB FROM UNDERMINING. IF DEEMED NECESSARY BY ENGINEER, CONTRACTOR MAY BE REQUIRED TO INJECT GROUT BENEATH THE SLAB TO PREVENT SETTLEMENT. COST FOR GROUT INJECTION WILL BE INCIDENTAL TO THE PROJECT. PLACE AND COMPACT EXCAVATED MATERIALS AND CONCRETE SLAB.

WCUT AND REMOVE CONCRETE SLAB AS NECESSARY TO ALLOW EXCAVATION FOR AND PLACEMENT OF PIPE AND SUMP. PROTECT ALL EQUIPMENT FROM DUST AND DAMAGE DURING CONSTRUCTION. PROTECT EXISTING SLAB FROM UNDERMINING. IF DEEMED NECESSARY BY ENGINEER, CONTRACTOR MAY BE REQUIRED TO INJECT GROUT BENEATH THE SLAB TO PREVENT SETTLEMENT. COST FOR GROUT INJECTION WILL BE INCIDENTAL TO THE PROJECT. REPLACE AND COMPACT EXCAVATED MATERIALS AND CONCRETE SLAB.

EXISTING PIPE WORK NOT SHOWN FOR CLARITY.

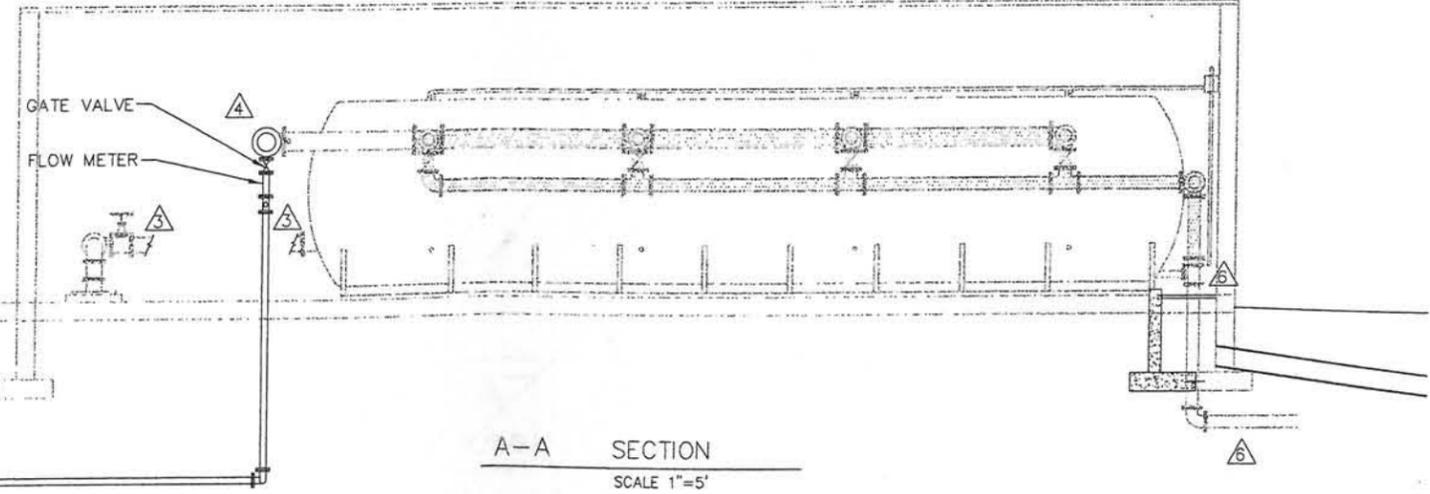
FIELD VERIFY LOCATION OF 4" RISER AND CUT IN POINT TO EXISTING SYSTEM WITH OWNER PRIOR TO CONSTRUCTION.

PROTECT FOOTING FROM UNDERMINING DURING PLACEMENT OF CASING.

TURN OFF EXISTING DISCHARGE LINES 1 FOOT ABOVE PROPOSED CURB ON SUMP. MOVE AND REPLACE ADDITIONAL PIPING TO ALLOW PLACEMENT OF NEW SUMP. PLUG AND GROUT FILL THOSE PORTIONS OF THE EXISTING DISCHARGE LINES THAT REMAIN BELOW THE FOOTINGS. TWO DISCHARGE LINES REMAIN. ONE RUNS TO THE EXISTING RECYCLE TANK AND ONE RUNS TO THE EXISTING STORM SEWER.

REMOVE AND JACK 12" DIAMETER STEEL CASING FOR INSTALLATION OF RECYCLE TANK TURN LINE. ALL PIPE JOINTS IN CASING SHALL BE MECHANICALLY RESTRAINED. CASING SHALL BE SUPPORTED ON MANUFACTURED CASING SPACERS. BLOW CASING WITH SILICA SAND. EXTEND CASING A MINIMUM OF 5' BEYOND CONCRETE SLAB.

EXISTING TANK DRAINS ARE PIPED TO THE EXISTING FLOOR DRAIN. CUT THEM OUT AND INCORPORATE THEM INTO NEW SUMP.



A-A SECTION
SCALE 1"=5'

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pce PROGRESSIVE CONSULTING ENGINEERS INC.
 (763)560-9133 FAX:(763)560-0333
 6120 EARLE BROWN DR. MINNEAPOLIS, MN. 55430

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 NAME: LANCE E. NEWMAN DATE: 5/20/05 REG No: 26192

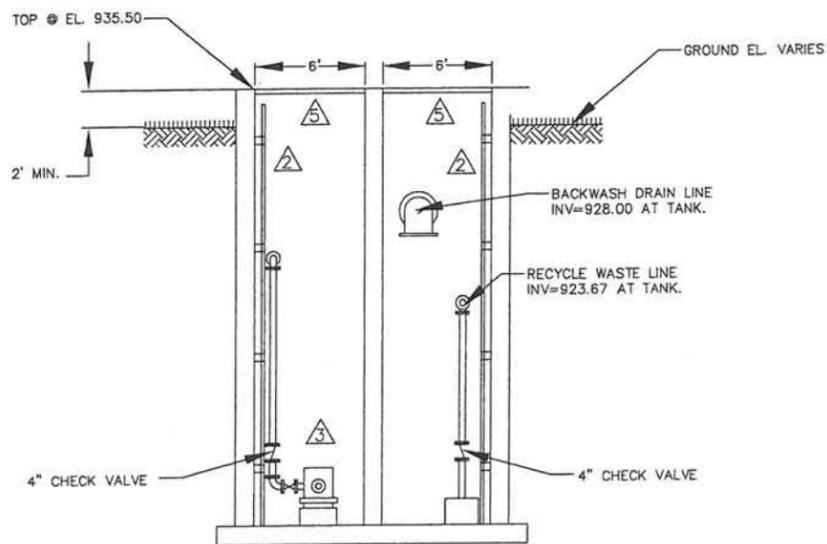
DESIGNED: LN
 DRAWN: BD
 CHECKED: LN
 DATE: 5/19/05

City of Edina, MN
 WTP 4 - CONNECTIONS AT PLANT

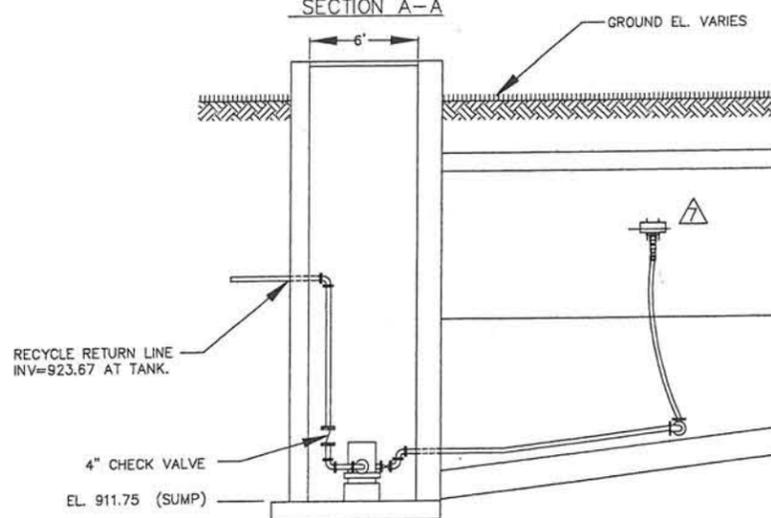
JOB NO. 03034
 ISSUE A
 DRAWING NO. G11

NOTES:

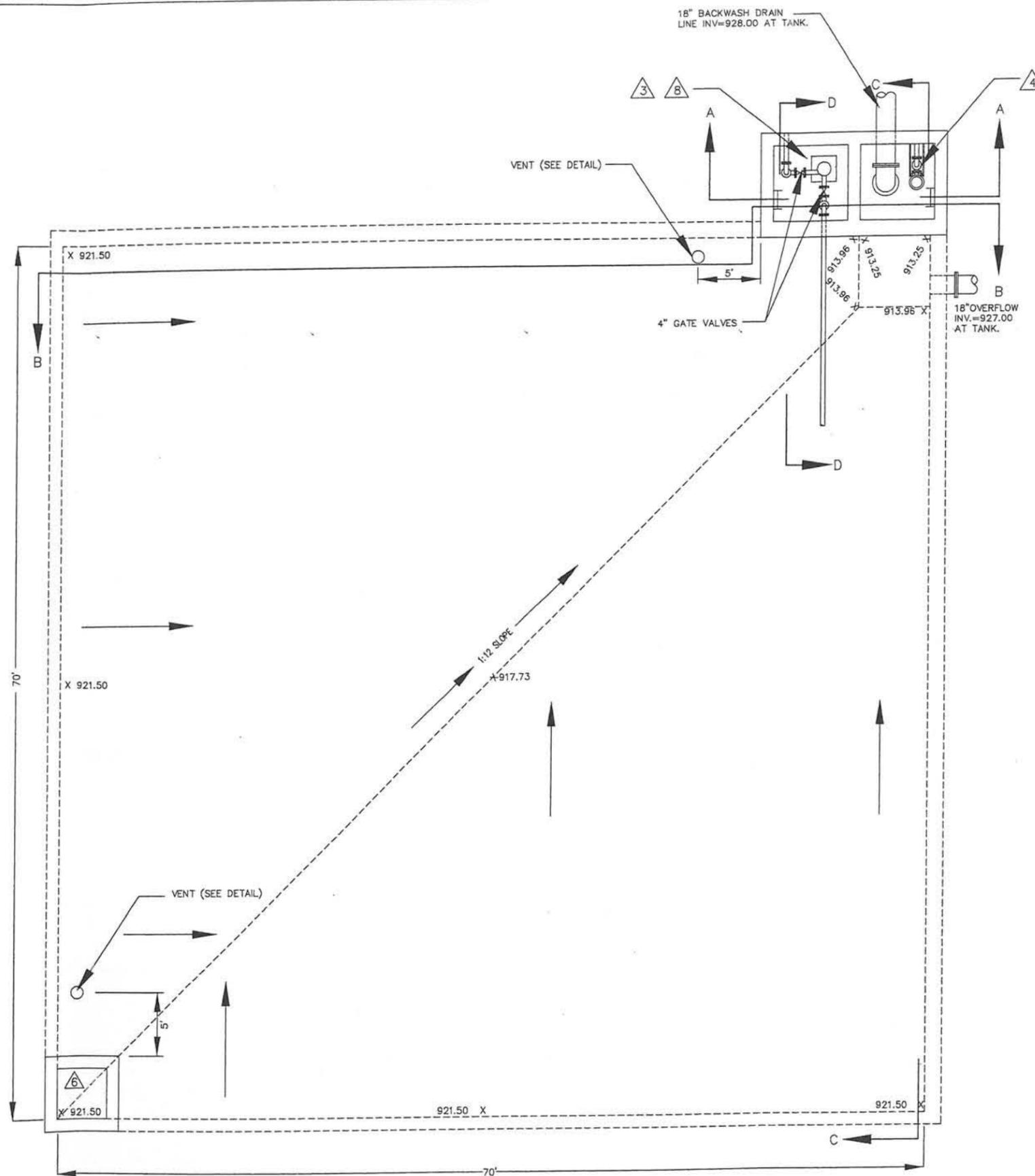
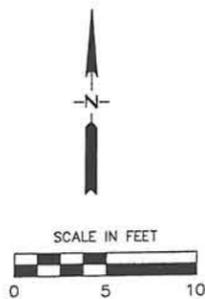
- ▲ SEE SITE PLAN FOR CONTINUATION OF PIPING.
- ▲ LADDER (SEE DETAIL).
- ▲ RECYCLE PUMP. ϕ OF IMPELLER @ 913.5.
- ▲ SLUDGE PUMP AND RAILS.
- ▲ EQUIPMENT HATCH (SEE DETAIL).
- ▲ 4'X4' BASIN ACCESS HATCH (SEE DETAIL).
- ▲ FLOATING INTAKE (SEE DETAIL).
- ▲ 2'X2' CONCRETE BASE FOR RECYCLE PUMP. HEIGHT AS NECESSARY TO MEET PUMP IMPELLER ϕ ELEVATION.
- ▲ PROVIDE WALL COLLARS AT ALL TANK WALL PENETRATIONS.



SECTION A-A



SECTION D-D



THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

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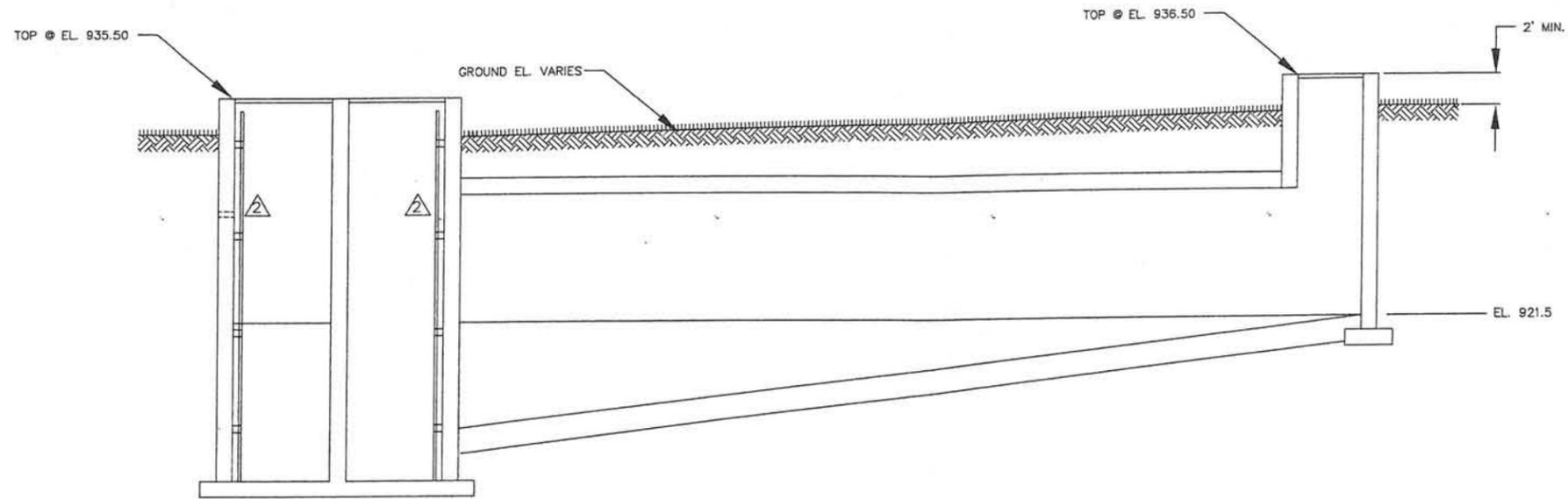
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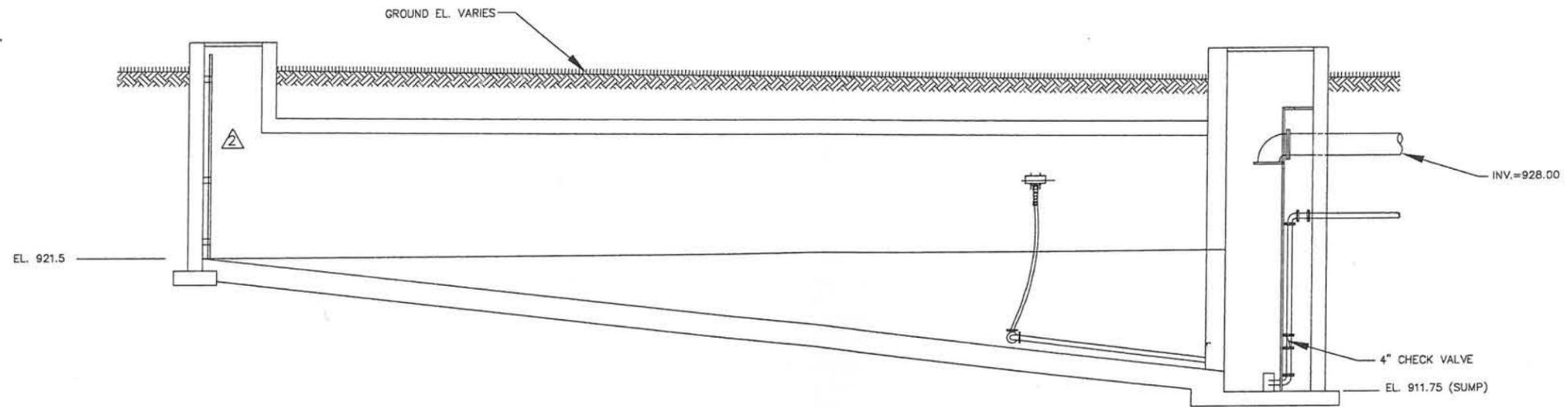
City of Edina, MN
 WTP 4 - RECYCLE BASIN PLAN

JOB NO. 03034
 ISSUE A
 DRAWING NO. G12

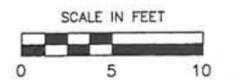
NOTES:
 ▲ SEE SITE PLAN FOR CONTINUATION OF PIPING.
 ▲ LADDER (SEE DETAIL).



SECTION B-B



SECTION C-C



1" = 10'
 LINE IS ONE INCH WHEN
 DRAWING IS FULL SIZE. IF NOT
 FULL SIZE, SCALE ACCORDINGLY.

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City of Edina, MN
 WTP 4 RECYCLE BASIN SECTIONS

JOB NO. 03034 ISSUE A
 DRAWING NO. G13

Attachment No. 3

Conceptual Cost Estimates

WTP #4 Analysis
Feasibility Level Cost Estimate

Barr Project #23/27-1331
11/15/2014

Area 1 Option A -Rebuild Sanitary Sewer from MH 1325 to 1315

Item	Quantity	Units	Unit Cost	Extension	Notes
<i>Pre-Construction</i>					
Mobilization	1	LS	\$ 43,000	\$ 43,000	10 % of work items
Sewer By-pass	28	Days	\$ 5,000	\$ 140,000	Assumes 24 hrs of attend pumping
<i>Demolition</i>					
Remove Bituminous Pavement and Curb	650	SY	\$ 6	\$ 3,673	Sawcut, remove bituminous, and dispose
Abandon Existing Pipe and Manholes	1170	LF	\$ 10	\$ 11,700	Fill existing pipes and manholes with flowable fill
<i>Utility Work</i>					
10" PVC Gravity Sewer	1170	LF	\$ 75	\$ 87,750	F&I pipe, assume 8-10' deep, backfill and compaction
48" Standard Manhole	6	EA	\$ 12,000	\$ 72,000	F&I Manhole and pipe connections
Resolve Utility Conflicts	1	LS	\$ 15,000	\$ 15,000	Allowance
Service Connections	6	Ea	\$ 5,000	\$ 30,000	Allowance
<i>Restoration</i>					
Curb and Gutter	500	LF	\$ 29	\$ 14,690	Standard curb and gutter
Site Restoration, Seed and Mulch	50	SY	\$ 20	\$ 1,000	Allowance
Bituminous Pavement	650	SY	\$ 90	\$ 58,500	Base course, bituminous surface, class 5
Construction Subtotal				\$ 477,313	
Construction Contingency	25	%		\$ 119,328	25 % of const. subtotal
Total Estimated Construction Cost				\$ 597,000	
Engineering and Administration	20	%		\$ 119,400	20% of estimate capital cost
Capital Total				\$ 720,000	

Qualifications:

Feasibility level estimate, plus 100%/minus 50%

Assuming good soil conditions

Necessary easements acquired by City of Edina

**WTP #4 Analysis
Feasibility Level Cost Estimate**

Barr Project #23/27-1331
11/15/2014

Area 1 Option B -Line Existing Sewer and install new forcemain

Item	Quantity	Units	Unit Cost	Extension	Notes
<i>Pre-Construction</i>					
Mobilization	1	LS	\$ 49,000	\$ 49,000	10 % of work items
Sewer By-pass	14	Days	\$ 5,000	\$ 70,000	Assumes 8 hrs of attend pumping
<i>Utility Work</i>					
Line 9-inch VCP (CIPP)	1830	LF	\$ 220	\$ 402,600	F&I CIPP liner
4" HDPE Forcemain (directional drill)	750	LF	\$ 110	\$ 82,500	F&I pipe and install by trenchless methods
Resolve Utility Conflicts	1	LS	\$ 5,000	\$ 5,000	Allowance
<i>Restoration</i>					
Site Restoration, Seed and Mulch	100	SY	\$ 20	\$ 2,000	Allowance
Construction Subtotal				\$ 611,100	
<i>Construction Contingency</i>		25	%	\$ 152,775	25 % of const. subtotal
Total Estimated Construction Cost				\$ 764,000	
Engineering and Administration		20	%	\$ 152,800	20% of estimate capital cost
Capital Total				\$ 920,000	

Qualifications:

Feasibility level estimate, plus 100%/minus 50%

Assuming good soil conditions

Necessary easements acquired by City of Edina

**WTP #4 Analysis
Feasibility Level Cost Estimate**

Barr Project #23/27-1331
11/15/2014

Area 2 Option A -Rebuild Sanitary Sewer from MH 1319 to 1376

Item	Quantity	Units	Unit Cost	Extension	Notes
<i>Pre-Construction</i>					
Mobilization	1	LS	\$ 15,000	\$ 15,000	10 % of work items
Sewer By-pass	21	Days	\$ 5,000	\$ 105,000	Assumes 8 hrs of attend pumping
<i>Demolition</i>					
Abandon Existing Pipe and Manholes	780	LF	\$ 10	\$ 7,800	Fill existing pipes and manholes with flowable fill
<i>Utility Work</i>					
10" PVC Gravity Sewer	780	LF	\$ 75	\$ 58,500	F&I pipe, assume 8-10' deep, backfill and compaction
48" Standard Manhole	5	EA	\$ 12,000	\$ 60,000	F&I Manhole and pipe connections
Resolve Utility Conflicts	2	LS	\$ 5,000	\$ 10,000	Allowance
Service Connections	1	Ea	\$ 5,000	\$ 5,000	Allowance
<i>Restoration</i>					
Site Restoration, Seed and Mulch	433	SY	\$ 20	\$ 8,667	Allowance
Construction Subtotal				\$ 269,967	
<i>Construction Contingency</i>	25	%		\$ 67,492	25 % of const. subtotal
Total Estimated Construction Cost				\$ 337,000	
Engineering and Administration	20	%		\$ 70,000	20% of estimate capital cost
Capital Total				\$ 410,000	

Qualifications:

Feasibility level estimate, plus 100%/minus 50%
Assuming good soil conditions
Necessary easements acquired by City of Edina

**WTP #4 Analysis
Feasibility Level Cost Estimate**

Barr Project #23/27-1331
11/15/2014

Area 2 Option B -Line Existing Sewer from MH 1319 to 1376

Item	Quantity	Units	Unit Cost	Extension	Notes
<i>Pre-Construction</i>					
Mobilization	1	LS	\$ 17,000	\$ 17,000	10 % of work items
Sewer By-pass	21	Days	\$ 5,000	\$ 105,000	Assumes 8 hrs of attend pumping
<i>Utility Work</i>					
Line 9-inch VCP (CIPP)	780	LF	\$ 210	\$ 163,800	F&I CIPP liner
Resolve Utility Conflicts	1	LS	\$ 5,000	\$ 5,000	Allowance
<i>Restoration</i>					
Site Restoration, Seed and Mulch	100	SY	\$ 20	\$ 2,000	Allowance
Construction Subtotal				\$ 292,800	
<i>Construction Contingency</i>		25	%	\$ 73,200	25 % of const. subtotal
Total Estimated Construction Cost				\$ 366,000	
Engineering and Administration		20	%	\$ 73,200	20% of estimate capital cost
Capital Total				\$ 440,000	

Qualifications:

Feasibility level estimate, plus 100%/minus 50%

Assuming good soil conditions

Necessary easements acquired by City of Edina

**WTP #4 Analysis
Feasibility Level Cost Estimate**

Barr Project #23/27-1331
11/15/2014

Area 3 Option A -Rebuild Sanitary Sewer from MH 1364 to 1759

Item	Quantity	Units	Unit Cost	Extension	Notes
<i>Pre-Construction</i>					
Mobilization	1	LS	\$ 42,000	\$ 42,000	10 % of work items
Sewer By-pass	28	Days	\$ 5,000	\$ 140,000	Assumes 8 hrs of attend pumping
<i>Demolition</i>					
Remove Bituminous Pavement and Curb	7	SY	\$ 6	\$ 42	Sawcut, remove bituminous, and dispose
Abandon Existing Pipe and Manholes	1300	LF	\$ 10	\$ 13,000	Remove existing pipes and manholes
<i>Utility Work</i>					
10" PVC Gravity Sewer	1300	LF	\$ 75	\$ 97,500	F&I pipe, assume 8-10' deep, backfill and compaction
48" Standard Manhole	9	EA	\$ 12,000	\$ 108,000	F&I Manhole and pipe connections
Resolve Utility Conflicts	4	LS	\$ 5,000	\$ 20,000	Allowance
Service Connections	4	Ea	\$ 5,000	\$ 20,000	Allowance
<i>Restoration</i>					
Curb and Gutter	200	LF	\$ 29	\$ 5,876	base course, B612 curb
Site Restoration, Seed and Mulch	722	SY	\$ 20	\$ 14,444	
Bituminous Pavement	10	SY	\$ 90	\$ 900	base course, bituminous surface
Construction Subtotal				\$ 461,762	
Construction Contingency	25	%		\$ 115,441	25 % of const. subtotal
Total Estimated Construction Cost				\$ 577,000	
Engineering and Administration	20	%		\$ 115,400	20% of estimate capital cost
Capital Total				\$ 690,000	

Qualifications:

Feasibility level estimate, plus 100%/minus 50%

Assuming good soil conditions

Necessary easements acquired by City of Edina