

2021 Sanitary Sewer Improvements

Preliminary Design Memo

DATE: September 28, 2021

TO: Mayor and City Council

City of Oelwein
20 2nd Ave SW
Oelwein, Iowa 50662

FOX P.N. 2003-20A

BACKGROUND

On December 30, 2020, the City received a Notice of Violation (567 IAC 64.3(1)) from the Iowa Department of Natural Resources. The notice outlined operation and maintenance issues within the collections system. During the review period there was 22 basement backups, 8 bypasses, and regular use of the EQ basin during wet weather flows. 13 of the basement backups were caused by rain events. Typically, City staff bypass pumps from surcharged manholes in the collection system to elevate flooding of residential basements. As a result of the IDNR's findings they issued four (4) requirements and six (6) recommendations.

FOX Engineering was tasked with reviewing the Staff identified collection system areas where these issues have historically occurred. The City completed CCTV of the sanitary sewer mains in these areas. FOX reviewed the CCTV footage and logged pipe issues. The CCTV generally showed heavy roots, joint separation, cracks, service issues, and offset joints in the Vitrified Clay Pipe (VCP) main. In some locations the sewer had dips and sags. Those issues contribute to reduced flow capacity and increased infiltration from the separated joints in the pipe.

FOX also modeled the trunk main for the NE quadrant of town, located in "Basin A", to determine where overflows and surcharging might be occurring within the system. FOX utilized subbasin flows from the 2008 "Sanitary Sewer Study" to create the Basin A sanitary sewer model. FOX then modified those flows to a peaking factor of 5 to establish a base flow within the aging collection system. Those base flows showed where capacity constraints were within the system under normal base flows.

FOX then analyzed the collection system for wet weather peak flows. The 2008 report determined that the City has an approximate peak hour wastewater flow factor of 10. This flow is based on historical data from the sanitary sewer wastewater treatment facility RWPS.

As a result of modeling the Basin A collection system, FOX was able to identify two problem areas that experience regular surcharging and overflows. FOX recommends two project sites to eliminate capacity restraints which are causing these issues. FOX also recommends CIPP lining upstream of these areas in the residential neighborhoods that are contributing flows to the trunk main within Basin A. CIPP projects will reduce I/I which is typically in aging systems with VCP main. CIPP projects also extend the

life of deteriorating collection systems at a significant savings over full dig repairs and removal and replacement.

The two project sites consist of repair and replacement of segments of the existing sanitary sewer collection system. Locations within the sanitary collection system do not have adequate capacity to handle flows during major rain events. This is seen at several locations where the water level in manholes rise with the hydraulic grade line and flooding of adjacent basements occur. Computer modeling indicated several bottlenecks in the system where sanitary sewer size and slope, along with topography of the surrounding areas, contribute to these backups. City staff was able to confirm these locations based on frequent maintenance calls during major rain events. City staff currently attempts to reduce the effects of sewer surcharging and basement backups in major rain events by pumping water from manholes located in the project area.

Capacity improvements will lower the hydraulic grade line and reduce surcharging associated with major rain events. Sections of sanitary sewer will be replaced with larger pipes to improve system capacities at existing bottlenecks. Various scenarios, including differing pipe diameters, were modeled to determine alternates that would reduce surcharging and improve conveyance of the peak flows downstream to the existing 18-inch trunk main.

Sanitary sewer services and water services shall be replaced along the project routes. Since the sewer is located in the existing street, new HMA pavement will be used to reconstruct the road after the sewer work has been completed.

PROJECT PHASING:

The project is anticipated to take approximately 7 months to complete. The project corridors are in two areas identified as SITE A and SITE B. See the attached Exhibits for figures of the project locations.

SITE A is located on 4th Avenue NE from 3rd Street NE to 5th Street NE, then over to 5th Avenue NE up to 6th Street NE. This site includes new sanitary sewer and sanitary services (5-ft past edge of pavement). A 6-inch HMA pavement section with 6-inch granular base will replace the existing street. SITE A is anticipated to take 4 months to complete.

SITE B is located on 2nd Street NE from North Frederick Avenue to 2nd Avenue NE. This site includes new sanitary sewer and sanitary services (5-ft past edge of pavement). A 15-inch main which is extremely flat and has stagnate wastewater will be replaced and rerouted with a new 15-inch sewer bored and steel cased under N Frederick Ave and across Veterans Memorial Park. Areas of HMA and PCC pavement will be replaced within the street. SITE B is anticipated to take 3 months to construct.

PROJECT SCHEDULE:

10.2021	Council Meeting: Approval of Final Design Task Order
12.1.2021	CDBG & IUP Application
02.2022	Council Meeting: Presentation of Final Design
03.15.2022	Commission Meeting for IUP Approval (FONSI takes 4-5 months)
12.21.2022	Council Meeting: Set the Bid Date for 01.26.2021 and Hold the Public Hearing
07.2022	Bid Date & Council Meeting: Hold Public Hearing and Award the Project
08.2022	Construction Can Begin once FONSI is cleared (7 months, but over the winter)
07.2023	Final Completion

OPINION OF COST:

The total estimated project cost for SITE A is \$1,170,000. The total estimated project cost for SITE B is \$670,000. The total cost for both projects is \$1,840,000. The detailed cost breakdowns are attached to this memo. The opinion of cost includes the construction costs, design fees, construction services, and administration fees for both projects. The City anticipates to apply for SRF Loan along with CDBG Funding.

Please contact us if you have any questions or comments regarding the Preliminary Design Memo.

FOX Engineering Associates, Inc.

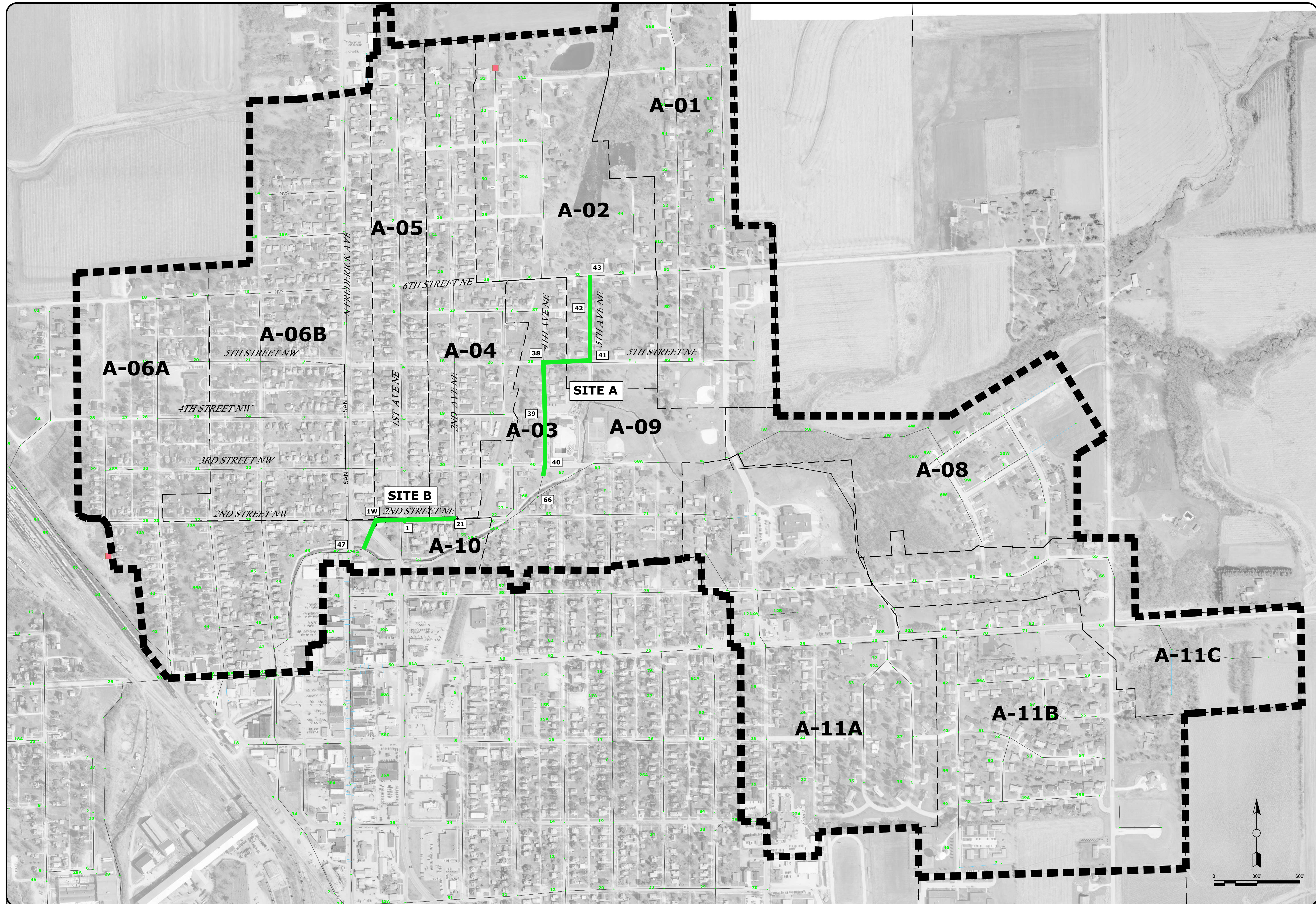
John Gade, P.E.

John Gade, P.E.
Project Manager

Attachments:

- Exhibit A – Drainage Basin A - Study Limits (Area of Analysis)
- Exhibit B – Hydraulic Grade Line Profile Models
- Exhibit C – Site A & B Proposed Sanitary Sewer Plan & Profile
- Engineer’s Opinion of Probable Project Costs, Site A & B

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REVISION	DATE	BY	DATE

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 Phone: (515) 233-0000
 FAX: (515) 233-0103

FOX engineering

DRAINAGE BASIN A - STUDY LIMITS
 OELWEIN COLLECTION SYSTEM IMPROVEMENTS
 2021
 OELWEIN, IA

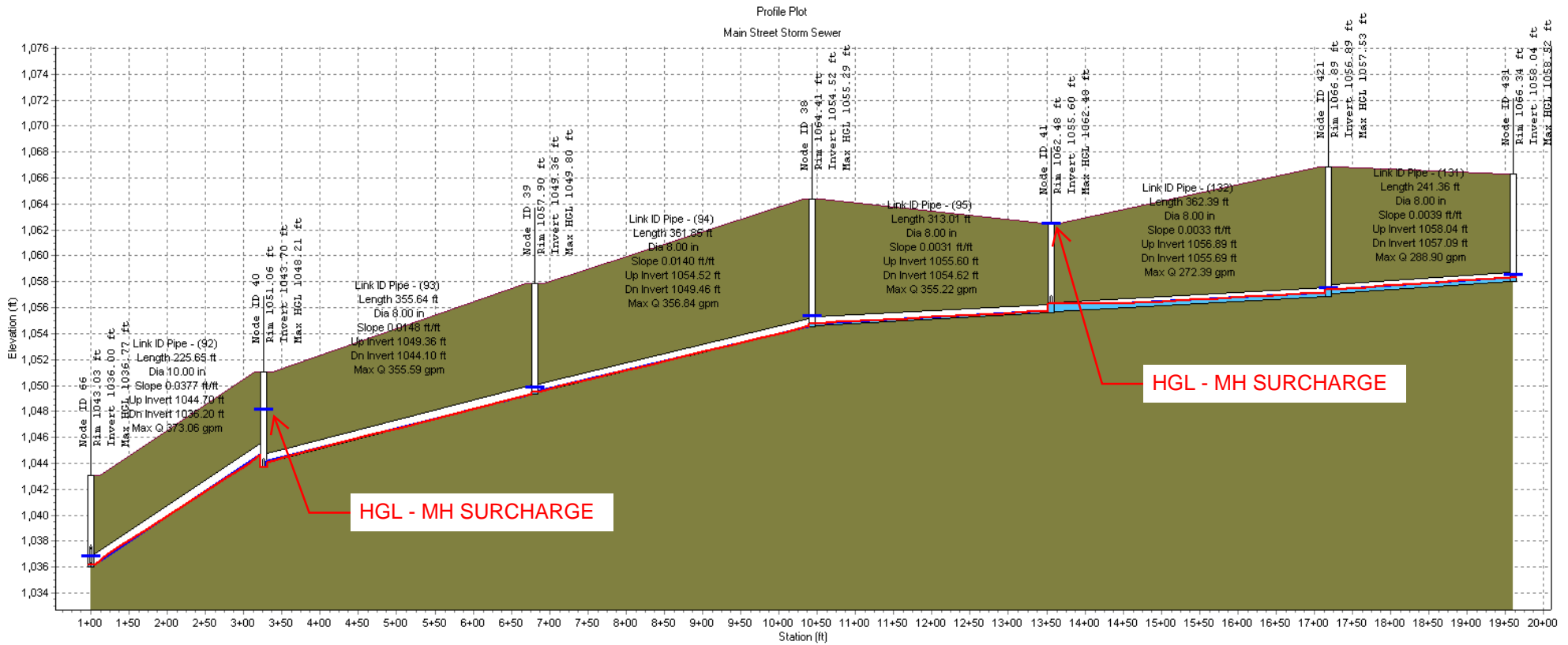
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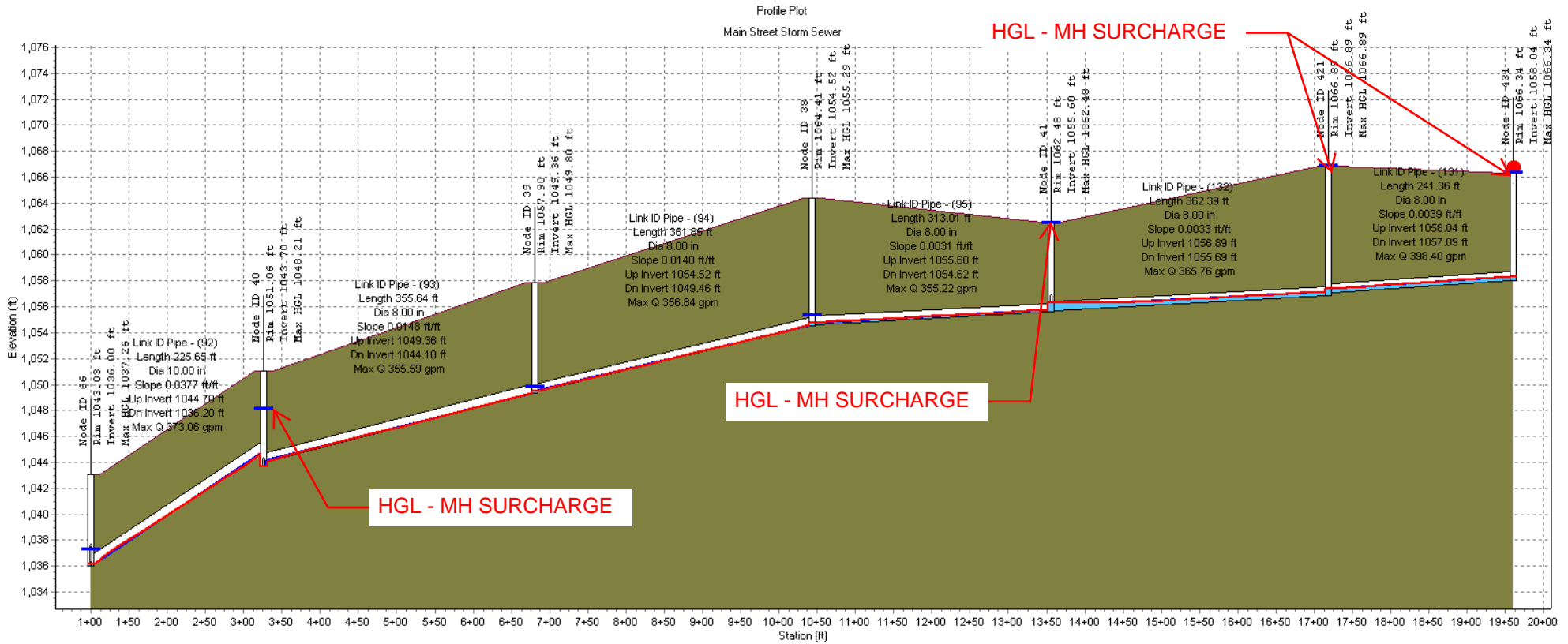
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2021 SANITARY COLLECTION SYSTEM SITE A - EXISTING CONDITIONS (PEAKING FACTOR OF 5)



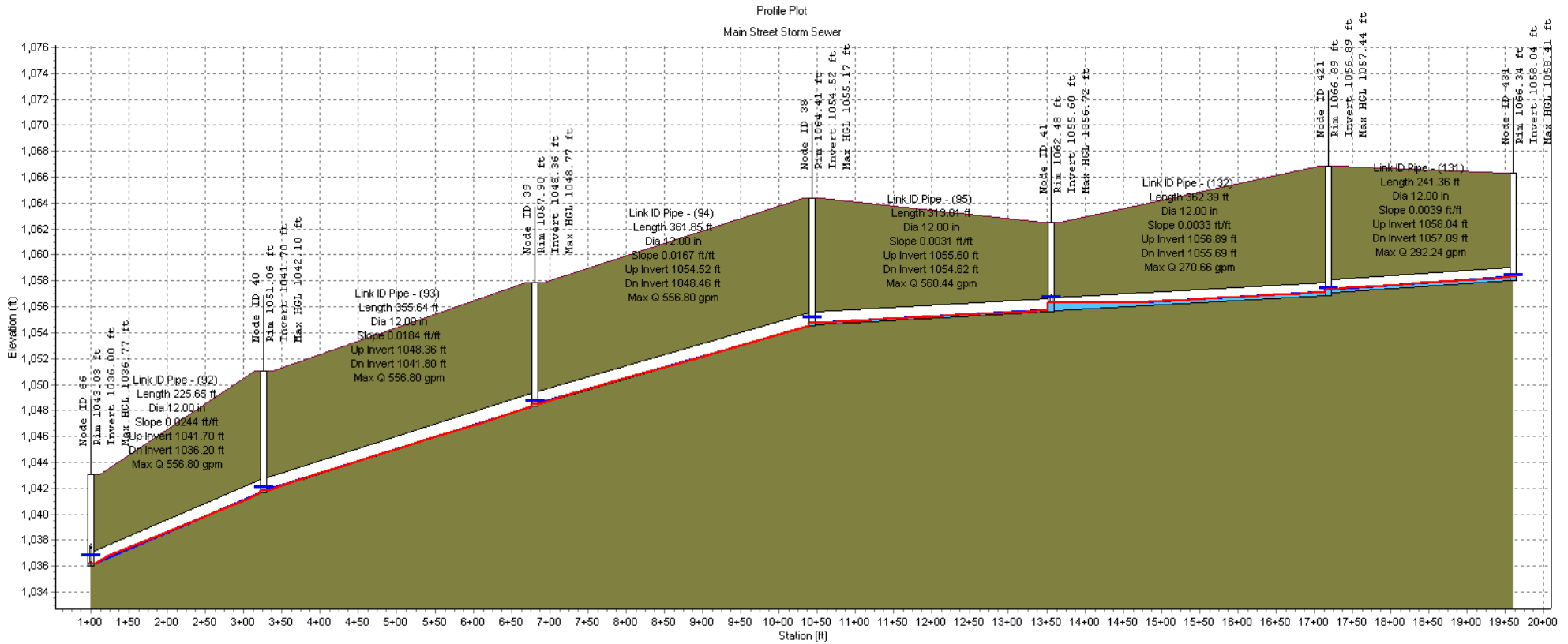
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Invert (ft):	1036.00	1043.70	1049.36	1054.52	1055.60	1056.89	1058.04
Min Pipe Cover (ft):	5.33		7.77	9.12	5.52	9.13	7.63
Max HGL (ft):	1036.77	1048.21	1049.80	1055.29	1062.48	1057.53	1058.52
Link ID:	Pipe - (92)	Pipe - (93)		Pipe - (94)	Pipe - (95)	Pipe - (132)	Pipe - (131)
Length (ft):	225.65	355.64		361.85	313.01	362.39	241.36
Dia (in):	10.00	8.00		8.00	8.00	8.00	8.00
Slope (ft/ft):	0.0377	0.0148		0.0140	0.0031	0.0033	0.0039
Up Invert (ft):	1044.70	1049.36		1054.52	1055.60	1056.89	1058.04
Dn Invert (ft):	1036.20	1044.10		1049.46	1054.62	1055.69	1057.09
Max Q (gpm):	373.06	355.59		356.84	355.22	272.39	288.90
Max Vel (ft/s):	17.20	4.62		4.60	2.30	2.45	2.57
Max Depth (ft):	0.23	0.33		0.34	0.67	0.45	0.45

2021 SANITARY COLLECTION SYSTEM SITE A - EXISTING CONDITIONS (PEAKING FACTOR OF 10)



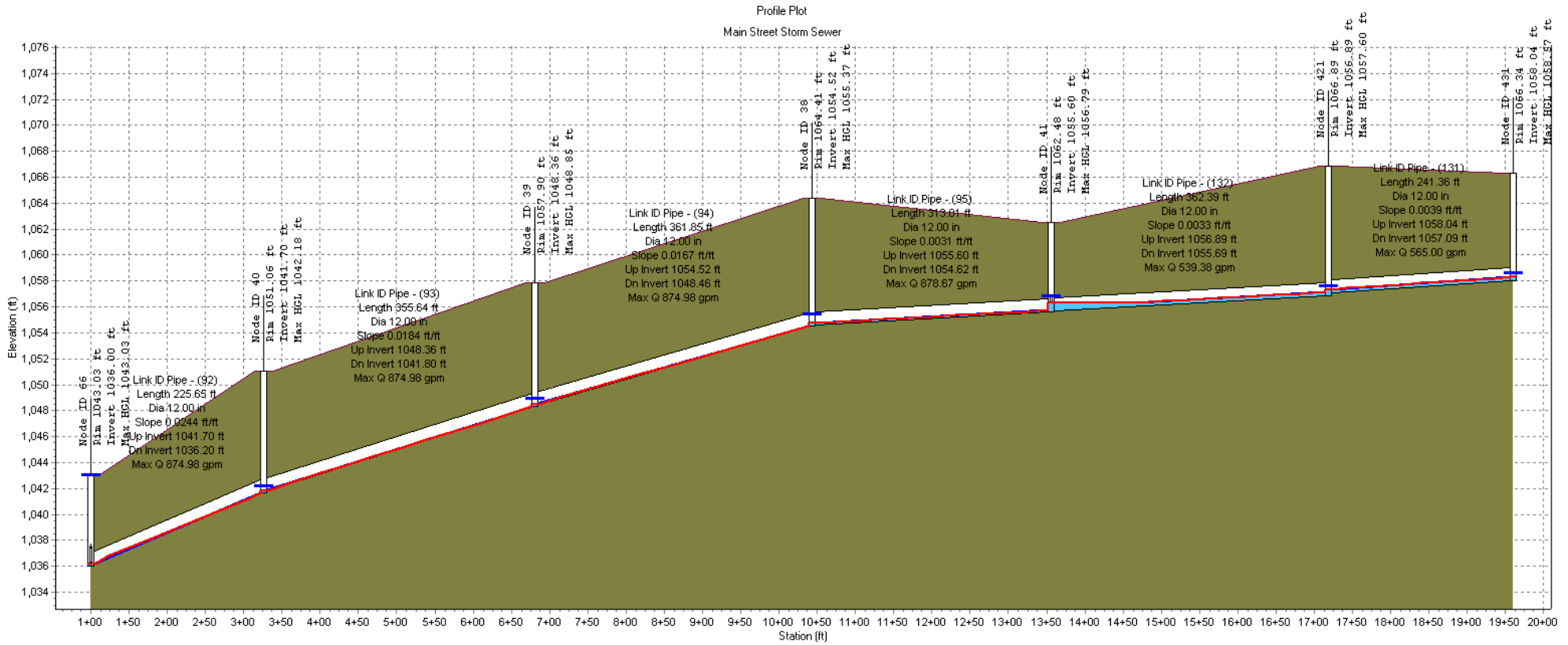
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Invert (ft):	1036.00	1043.70	1049.36	1054.52	1055.60	1056.89	1058.04
Min Pipe Cover (ft):	5.33		7.77	9.12	5.52	9.13	7.63
Max HGL (ft):	1037.26	1048.21	1049.80	1055.29	1062.48	1066.89	1066.34
Link ID:	Pipe - (92)	Pipe - (93)	Pipe - (94)	Pipe - (95)	Pipe - (132)	Pipe - (131)	
Length (ft):	225.65	355.64	361.85	313.01	362.39	241.36	
Dia (in):	10.00	8.00	8.00	8.00	8.00	8.00	
Slope (ft/ft):	0.0377	0.0148	0.0140	0.0031	0.0033	0.0039	
Up Invert (ft):	1044.70	1049.36	1054.52	1055.60	1056.89	1058.04	
Dn Invert (ft):	1036.20	1044.10	1049.46	1054.62	1055.69	1057.09	
Max Q (gpm):	373.06	355.59	356.84	355.22	365.76	398.40	
Max Vel (ft/s):	17.20	4.62	4.60	2.30	2.63	2.65	
Max Depth (ft):	0.23	0.33	0.34	0.67	0.63	0.67	

2021 SANITARY COLLECTION SYSTEM SITE A - PROPOSED IMPROVEMENTS (PEAKING FACTOR OF 5)



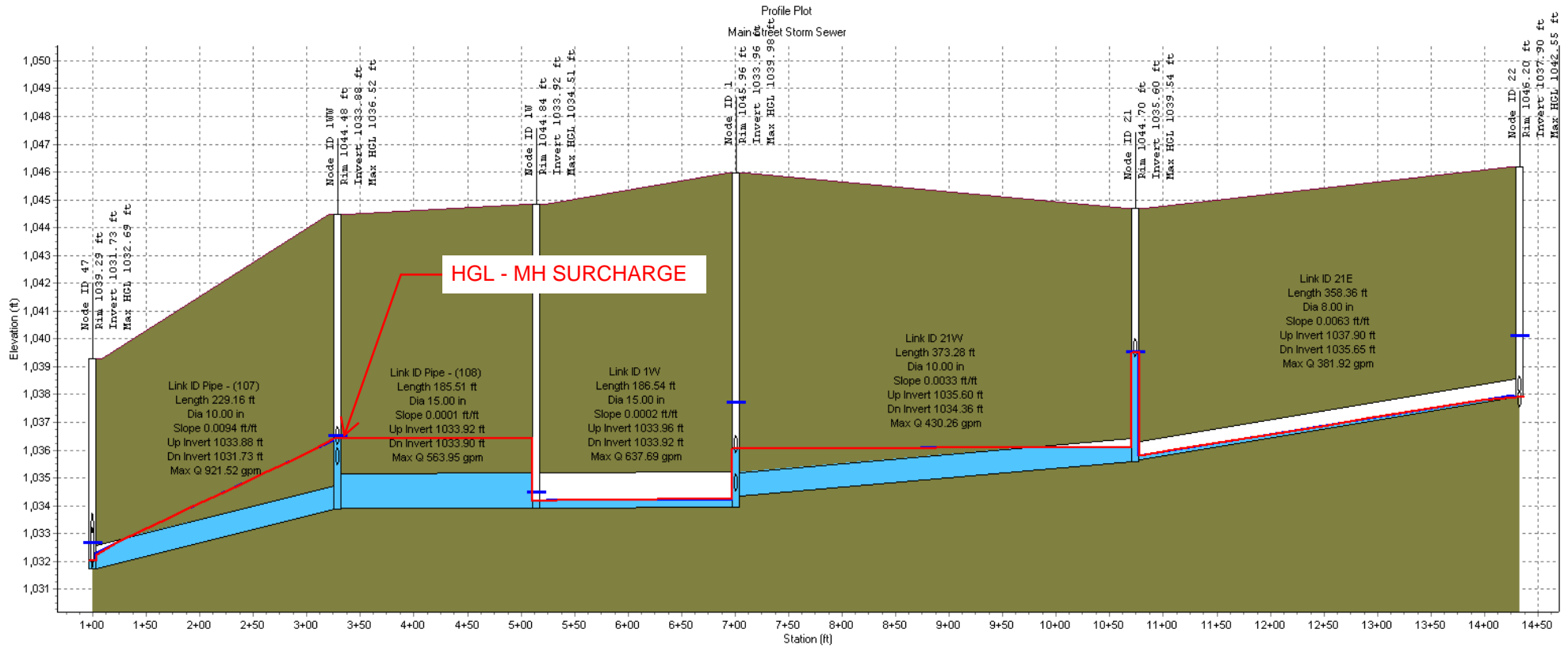
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Invert (ft):	1036.00	1041.70	1048.36	1054.52	1055.60	1056.89	1058.04
Min Pipe Cover (ft):	5.33	8.26	8.44	8.79	5.52	8.80	7.30
Max HGL (ft):	1036.77	1042.10	1048.77	1055.17	1056.72	1057.44	1058.41
Link ID:	Pipe - (92)	Pipe - (93)	Pipe - (94)	Pipe - (95)	Pipe - (132)	Pipe - (131)	
Length (ft):	225.65	355.64	361.85	313.01	362.39	241.36	
Dia (in):	12.00	12.00	12.00	12.00	12.00	12.00	
Slope (ft/ft):	0.0244	0.0184	0.0167	0.0031	0.0033	0.0039	
Up Invert (ft):	1041.70	1048.36	1054.52	1055.60	1056.89	1058.04	
Dn Invert (ft):	1036.20	1041.80	1048.46	1054.62	1055.69	1057.09	
Max Q (gpm):	556.80	556.80	556.80	560.44	270.66	292.24	
Max Vel (ft/s):	6.04	6.23	6.02	2.88	2.44	2.55	
Max Depth (ft):	0.31	0.30	0.31	0.54	0.35	0.35	

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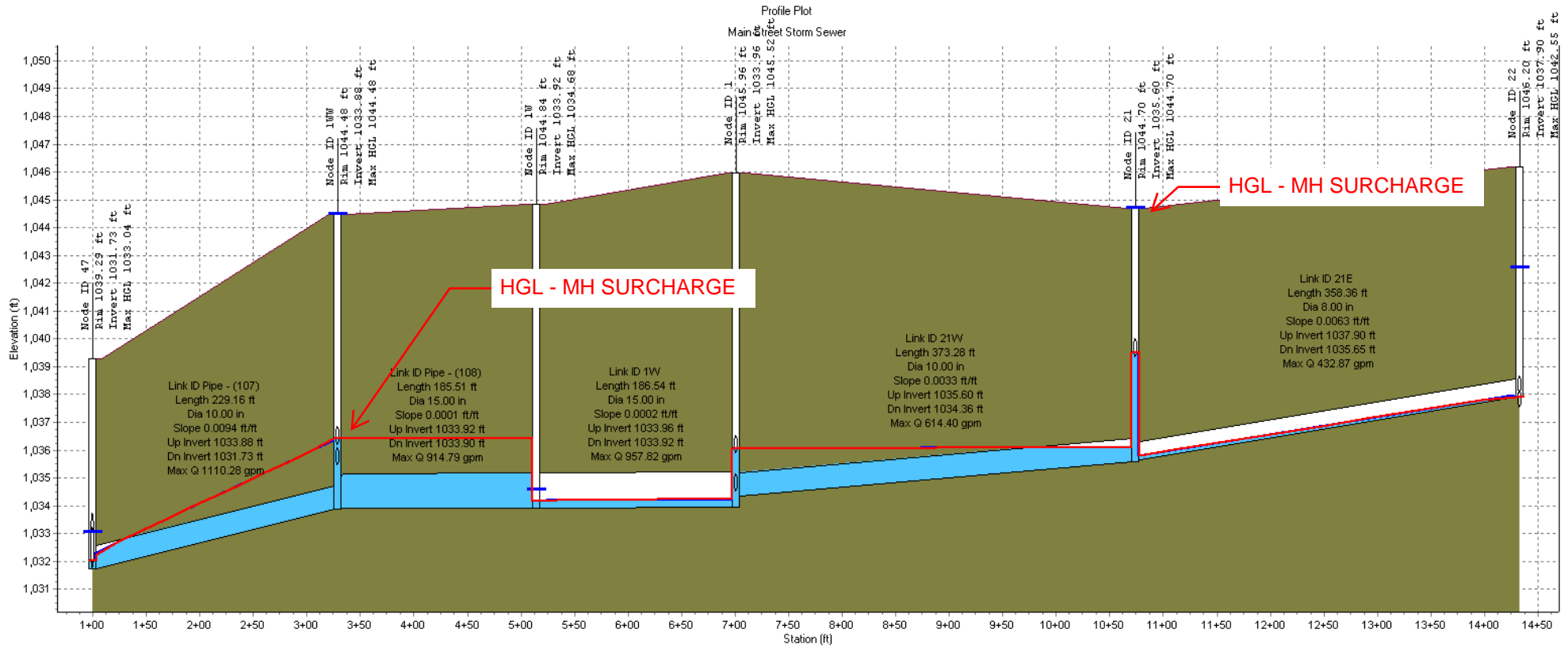
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Invert (ft):	1036.00	1041.70	1048.36	1054.52	1055.60	1056.89	1058.04
Min Pipe Cover (ft):	5.33	8.26	8.44	8.79	5.52	8.80	7.30
Max HGL (ft):	1043.03	1042.18	1048.85	1055.37	1056.79	1057.60	1058.57
Link ID:	Pipe - (92)	Pipe - (93)	Pipe - (94)	Pipe - (95)	Pipe - (132)	Pipe - (131)	
Length (ft):	225.65	355.64	361.85	313.01	362.39	241.36	
Dia (in):	12.00	12.00	12.00	12.00	12.00	12.00	
Slope (ft/ft):	0.0244	0.0184	0.0167	0.0031	0.0033	0.0039	
Up Invert (ft):	1041.70	1048.36	1054.52	1055.60	1056.89	1058.04	
Dn Invert (ft):	1036.20	1041.80	1048.46	1054.62	1055.69	1057.09	
Max Q (gpm):	874.98	874.98	874.98	878.67	539.38	565.00	
Max Vel (ft/s):	6.84	7.06	6.82	3.14	2.90	3.07	
Max Depth (ft):	0.39	0.38	0.39	0.74	0.52	0.51	

2021 SANITARY COLLECTION SYSTEM SITE B - EXISTING CONDITIONS (PEAKING FACTOR OF 5)



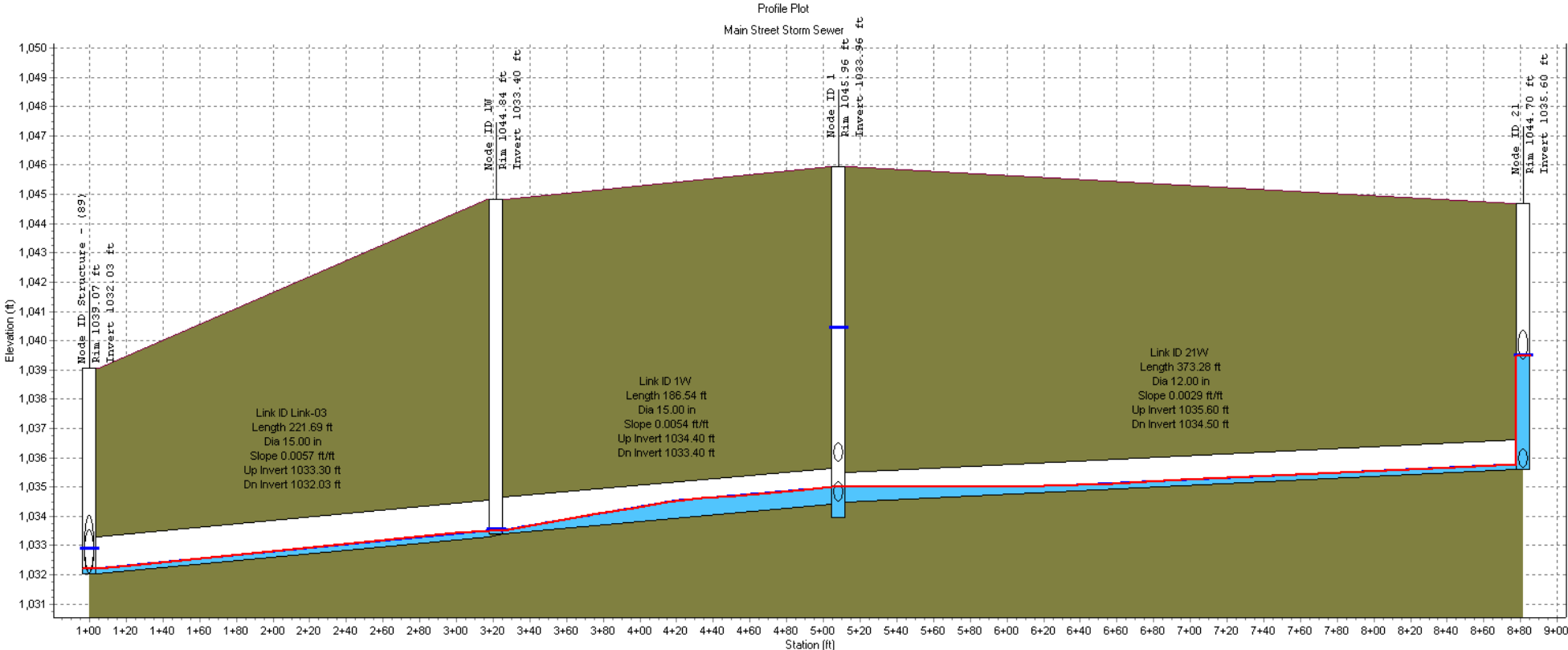
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Invert (ft):	1031.73	1033.88	1033.92	1033.96	1035.60	1037.90
Min Pipe Cover (ft):	5.56	7.63	9.67		4.69	
Max HGL (ft):	1032.69	1036.52	1034.51	1039.98	1039.54	1042.55
Link ID:	Pipe - (107)	Pipe - (108)	1W	21W	21E	
Length (ft):	229.16	185.51	186.54	373.28	358.36	
Dia (in):	10.00	15.00	15.00	10.00	8.00	
Slope (ft/ft):	0.0094	0.0001	0.0002	0.0033	0.0063	
Up Invert (ft):	1033.88	1033.92	1033.96	1035.60	1037.90	
Dn Invert (ft):	1031.73	1033.90	1033.92	1034.36	1035.65	
Max Q (gpm):	921.52	563.95	637.69	430.26	381.92	
Max Vel (ft/s):	5.19	3.51	6.39	3.38	7.94	
Max Depth (ft):	0.57	0.47	0.48	0.46	0.35	

2021 SANITARY COLLECTION SYSTEM SITE B - EXISTING CONDITIONS (PEAKING FACTOR OF 10)



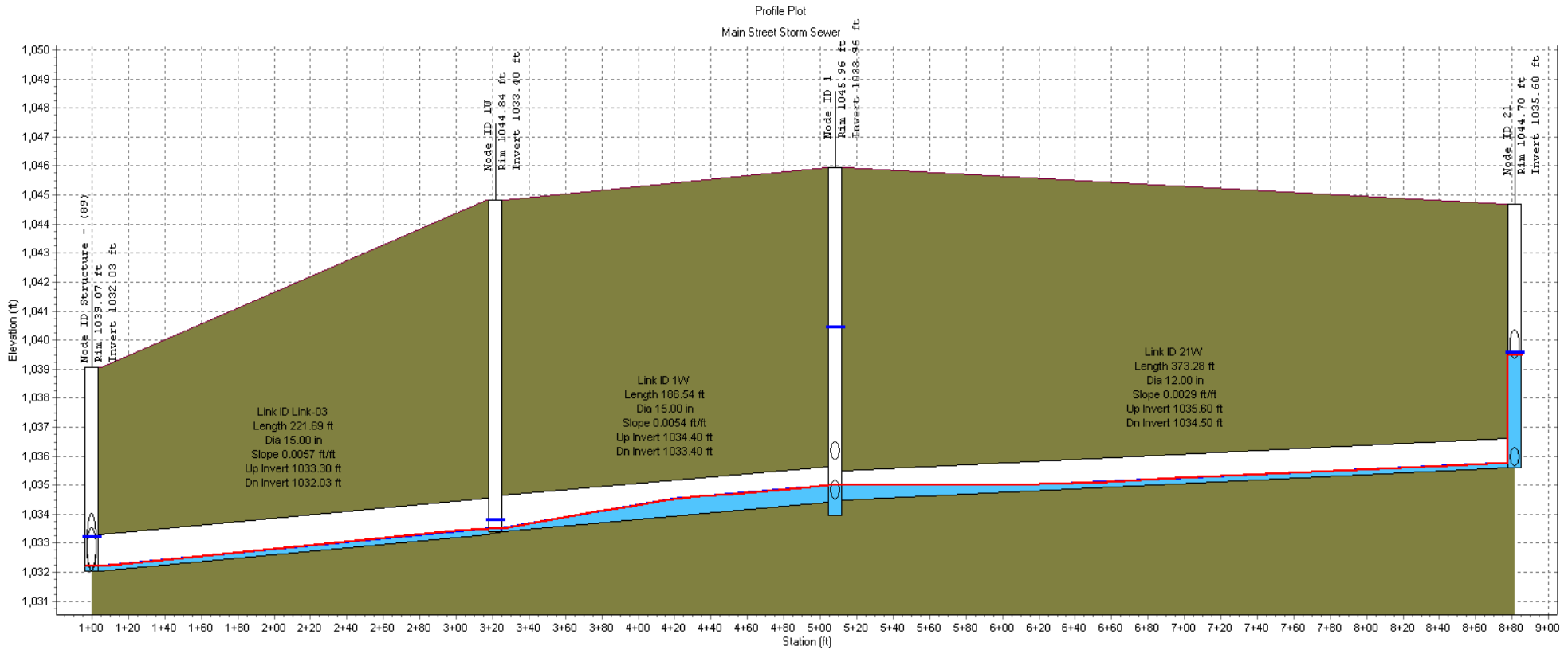
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Rim (ft):	1039.29	1044.48	1044.84	1045.96	1044.70	1046.20
Invert (ft):	1031.73	1033.88	1033.92	1033.96	1035.60	1037.90
Min Pipe Cover (ft):	5.56	7.63	9.67		4.69	
Max HGL (ft):	1033.04	1044.48	1034.68	1045.52	1044.70	1042.55
Link ID:	Pipe - (107)	Pipe - (108)	1W	21W	21E	
Length (ft):	229.16	185.51	186.54	373.28	358.36	
Dia (in):	10.00	15.00	15.00	10.00	8.00	
Slope (ft/ft):	0.0094	0.0001	0.0002	0.0033	0.0063	
Up Invert (ft):	1033.88	1033.92	1033.96	1035.60	1037.90	
Dn Invert (ft):	1031.73	1033.90	1033.92	1034.36	1035.65	
Max Q (gpm):	1110.28	914.79	957.82	614.40	432.87	
Max Vel (ft/s):	5.33	3.68	6.60	3.38	7.96	
Max Depth (ft):	0.83	0.63	0.68	0.62	0.37	

2021 SANITARY COLLECTION SYSTEM SITE B - PROPOSED IMPROVEMENTS (PEAKING FACTOR OF 5)



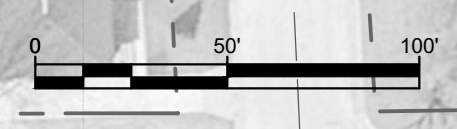
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Rim (ft):	1039.07	1044.84	1045.96	1044.70
Invert (ft):	1032.03	1033.40	1033.96	1035.60
Min Pipe Cover (ft):	5.03	10.19		4.36
Max HGL (ft):	1032.90	1033.68	1040.43	1039.51
Link ID:	Link-03	1W		21W
Length (ft):	221.69	186.54		373.28
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Slope (ft/ft):	0.0057	0.0054		0.0029
Up Invert (ft):	1033.30	1034.40		1035.60
Dn Invert (ft):	1032.03	1033.40		1034.50
Max Q (gpm):	182.15	217.26		148.43
Max Vel (ft/s):	3.26	7.16		1.97
Max Depth (ft):	0.20	0.21		0.27

2021 SANITARY COLLECTION SYSTEM SITE B - PROPOSED IMPROVEMENTS (PEAKING FACTOR OF 10)



Node ID:	Structure - (89)	1W	1	21
Rim (ft):	1039.07	1044.84	1045.96	1044.70
Invert (ft):	1032.03	1033.40	1033.96	1035.60
Min Pipe Cover (ft):	5.03	10.19		4.36
Max HGL (ft):	1033.20	1033.82	1040.80	1039.58
Link ID:	Link-03	1W		21W
Length (ft):	221.69	186.54		373.28
Dia (in):	15.00	15.00		12.00
Slope (ft/ft):	0.0057	0.0054		0.0029
Up Invert (ft):	1033.30	1034.40		1035.60
Dn Invert (ft):	1032.03	1033.40		1034.50
Max Q (gpm):	467.14	481.10		294.73
Max Vel (ft/s):	4.36	8.83		2.36
Max Depth (ft):	0.36	0.34		0.38

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	LAST UPDATE:	9/21/21

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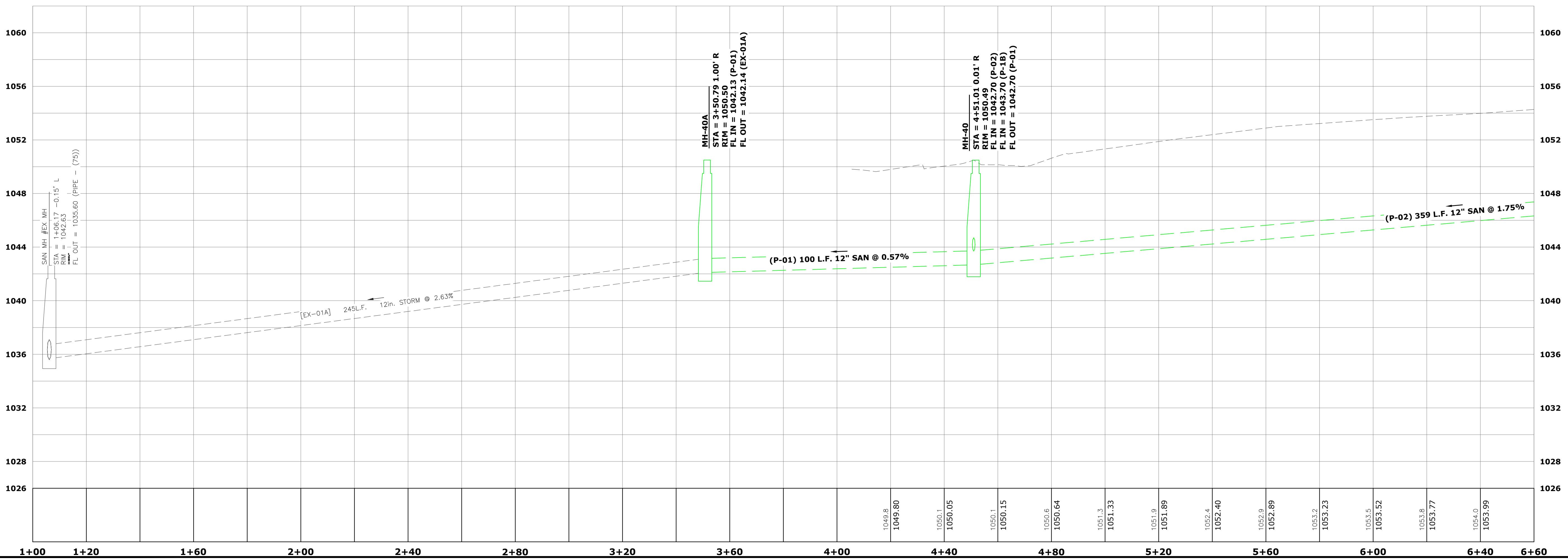


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 OELWEIN COLLECTION SYSTEM IMPROVEMENTS
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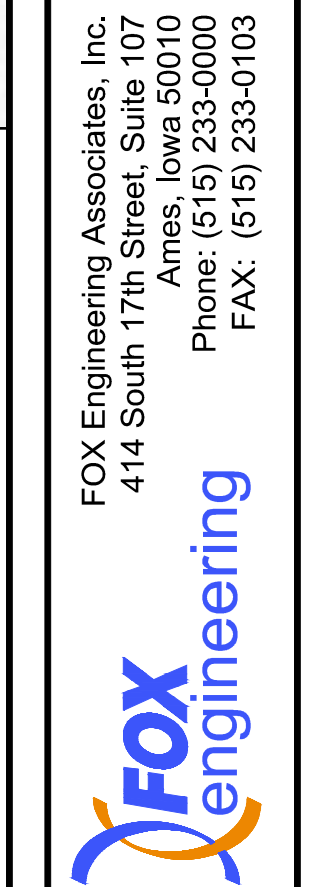
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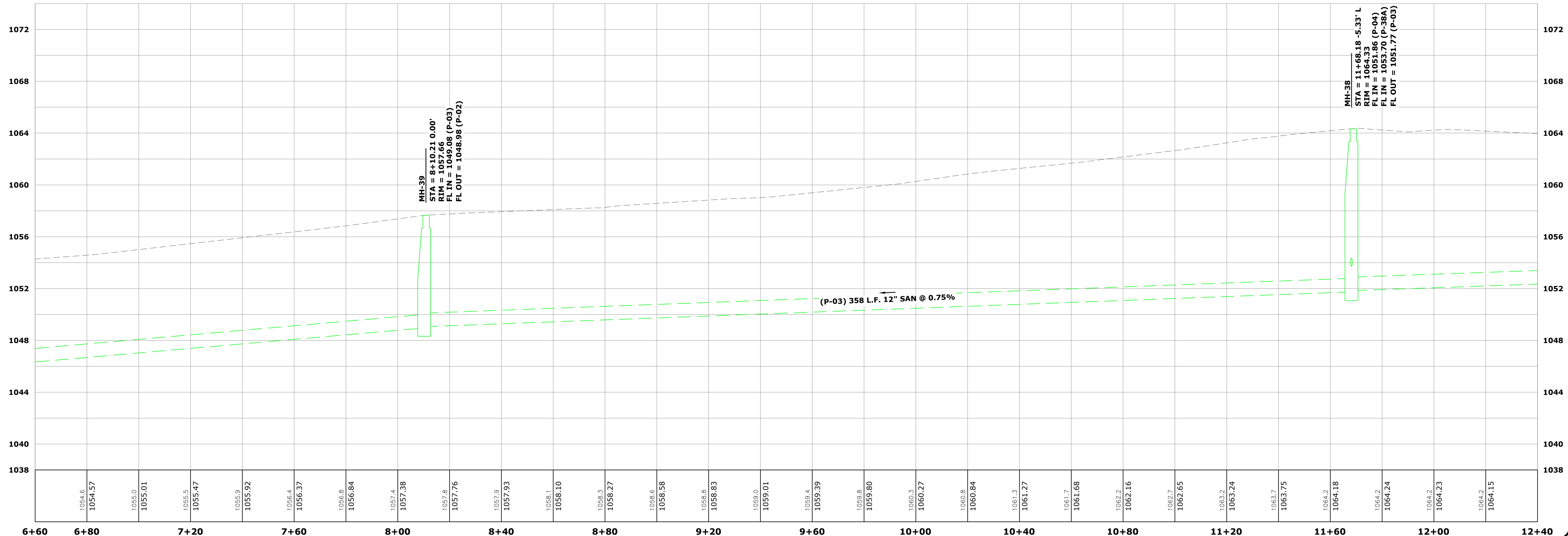
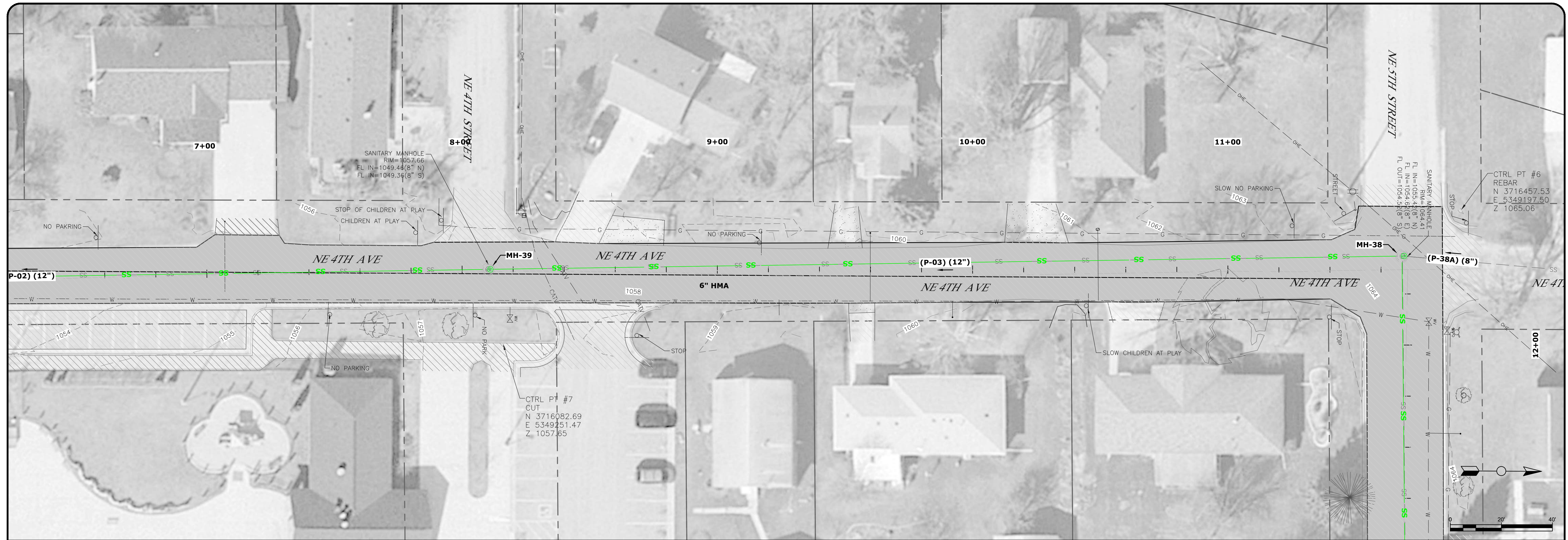
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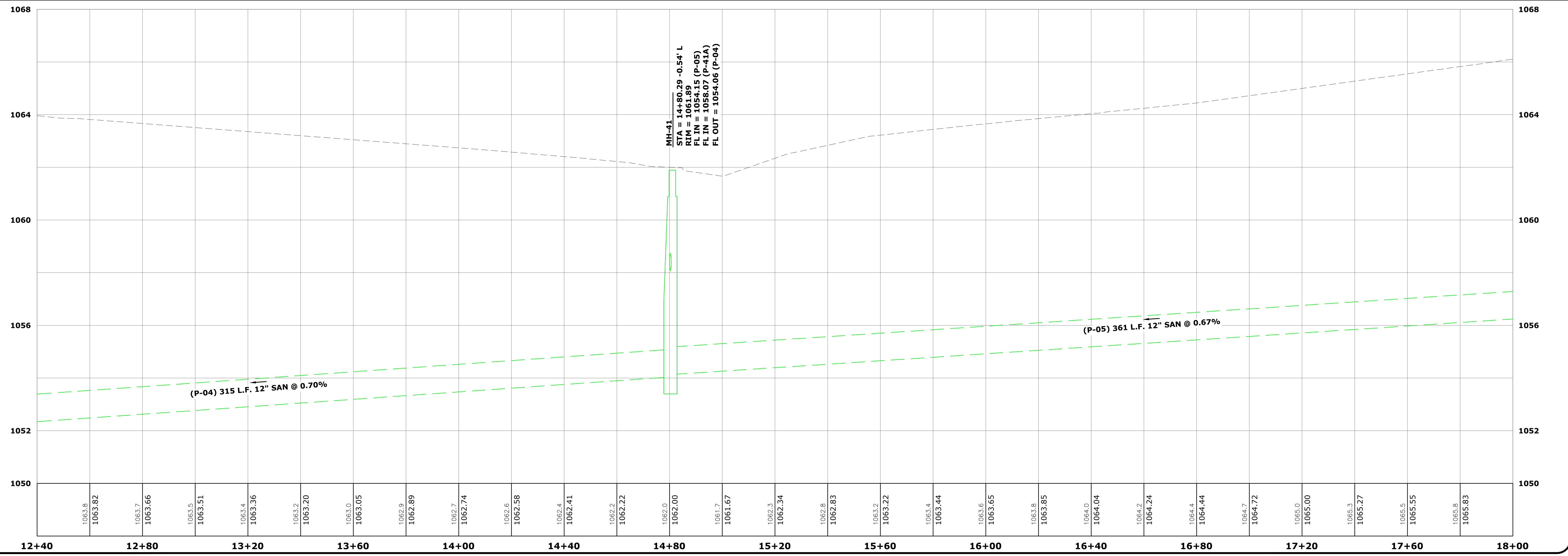


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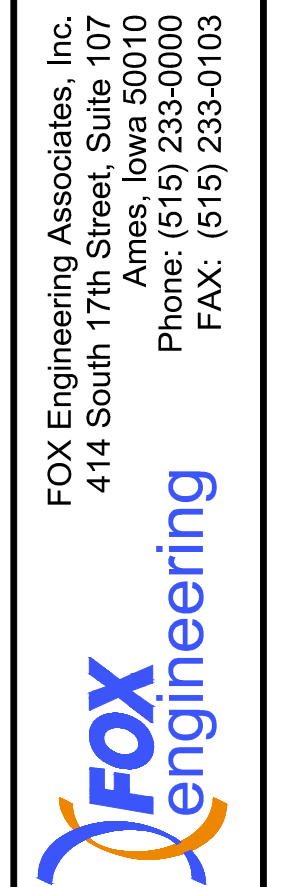
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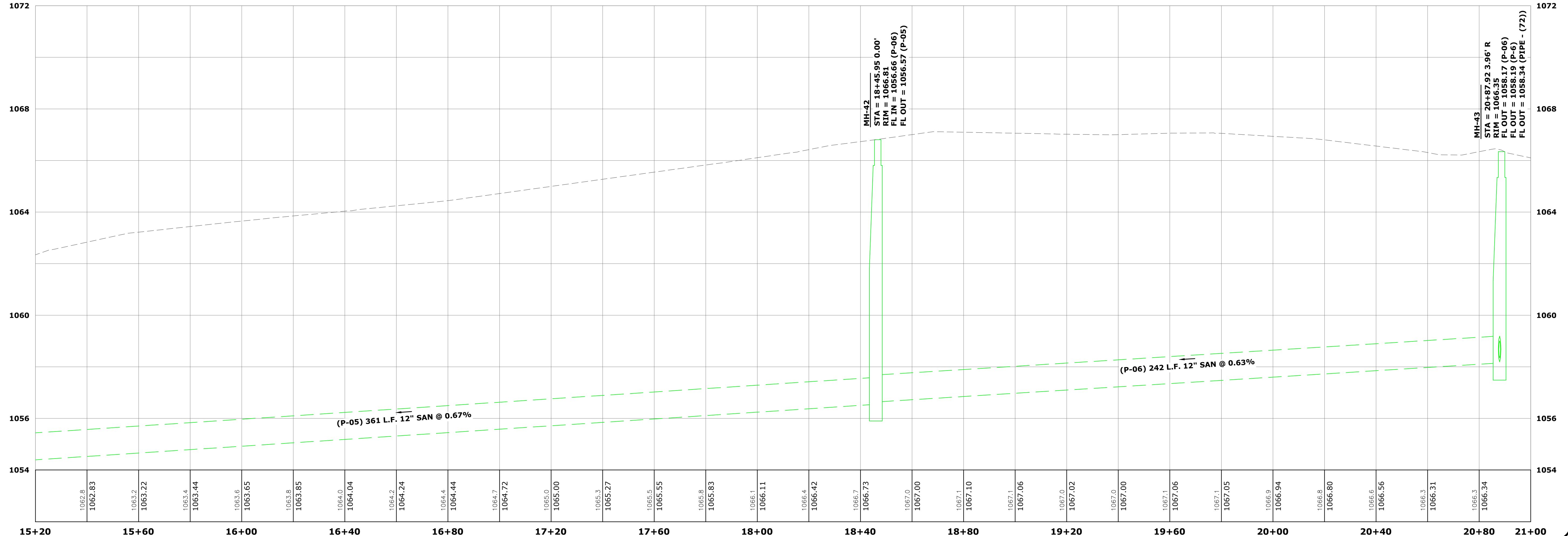
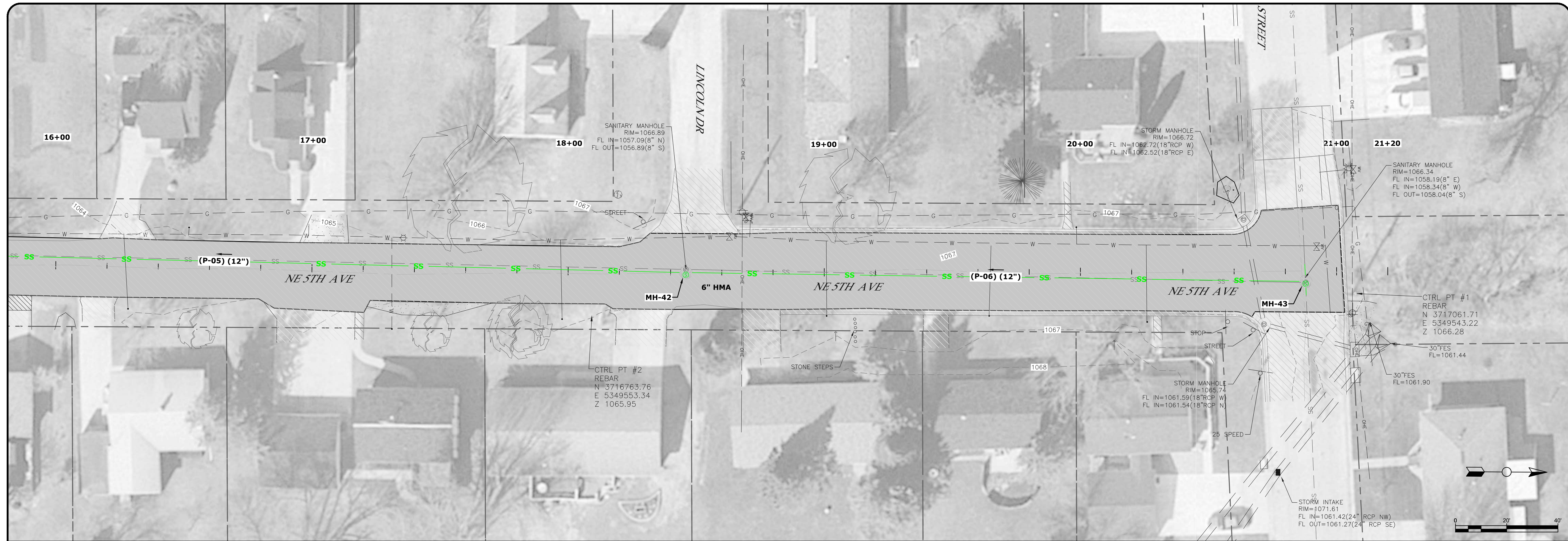


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09/21					9/21/21

REVISION	DATE

FOX Engineering Associates, Inc.
 414 South 17th Street, Suite 107
 Ames, Iowa 50010
 Phone: (515) 233-0000
 FAX: (515) 233-0103

FOX engineering

SANITARY SEWER PLAN & PROFILE
 OELWEIN COLLECTION SYSTEM IMPROVEMENTS
 2021
 OELWEIN, IA

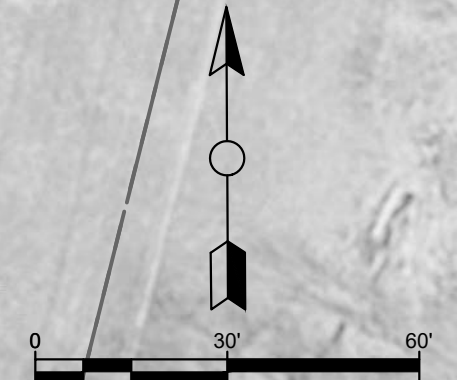
PROJECT NO.
 2003-20A

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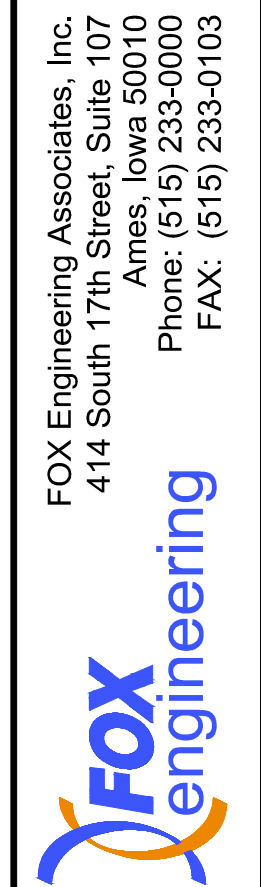
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FOX ENGINEERING



DATE	REVISION	BY	DATE
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	LAST UPDATE:		9/21/21

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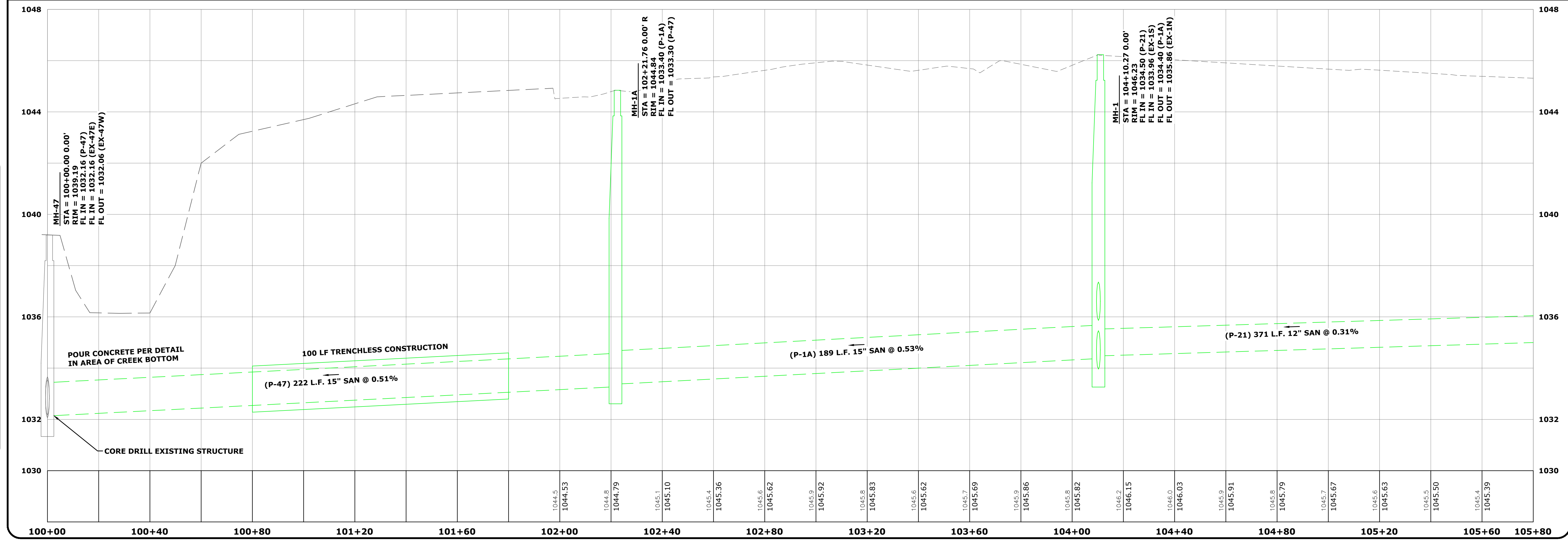
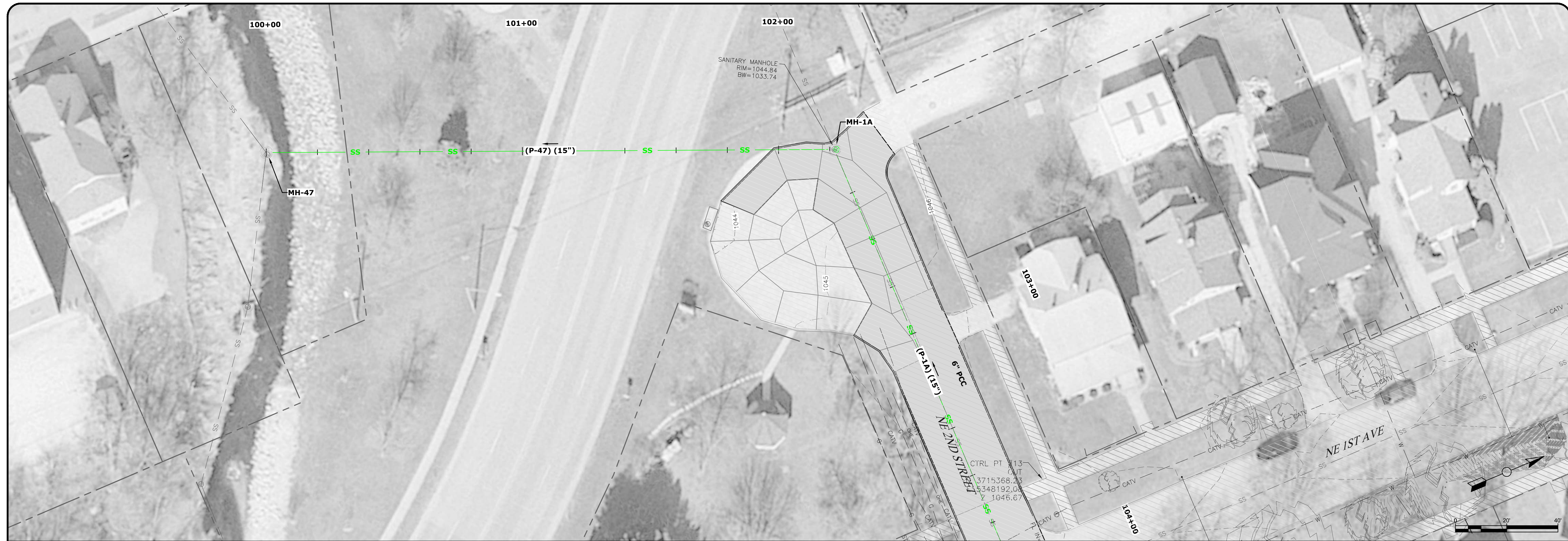


SANITARY SEWER PLAN & PROFILE
 OELWEIN COLLECTION SYSTEM IMPROVEMENTS
 2021
 OELWEIN, IA

PROJECT NO.
 2003-20A

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DATE	09/21
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LAST UPDATE	9/21/21

REVISION	DATE

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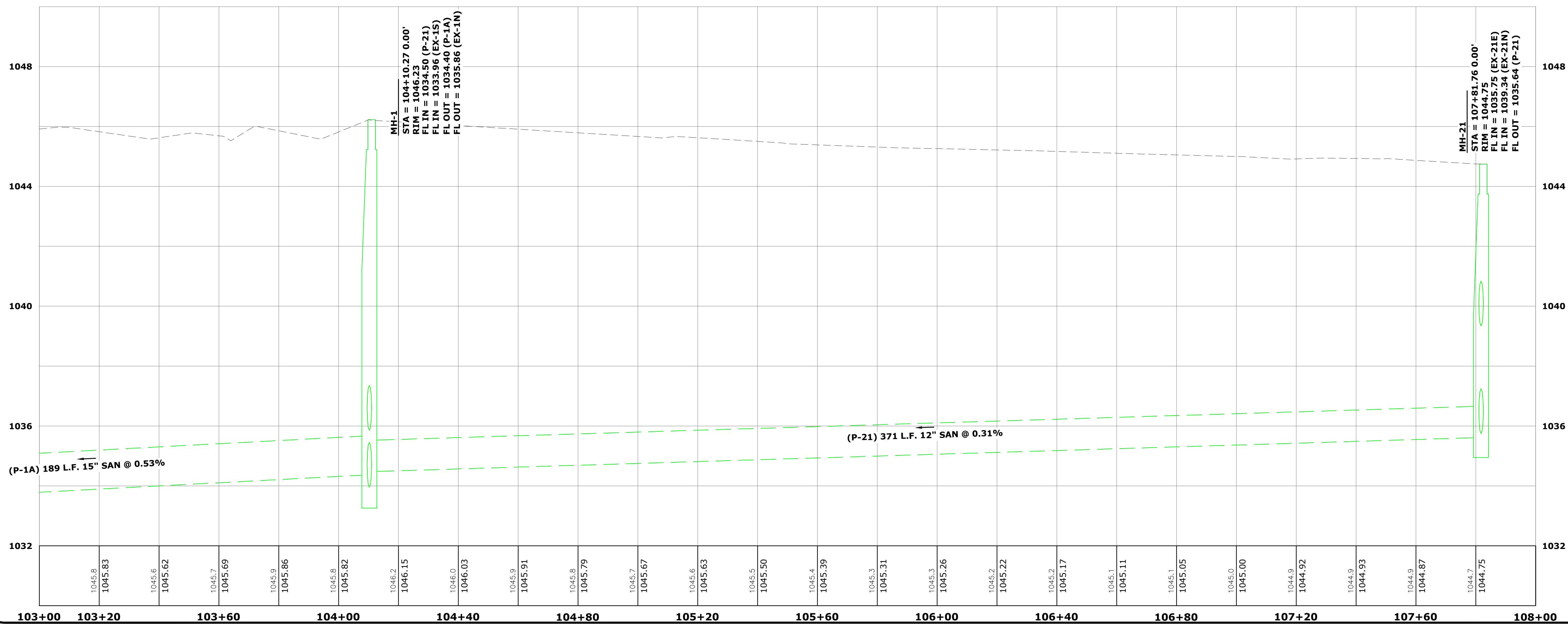
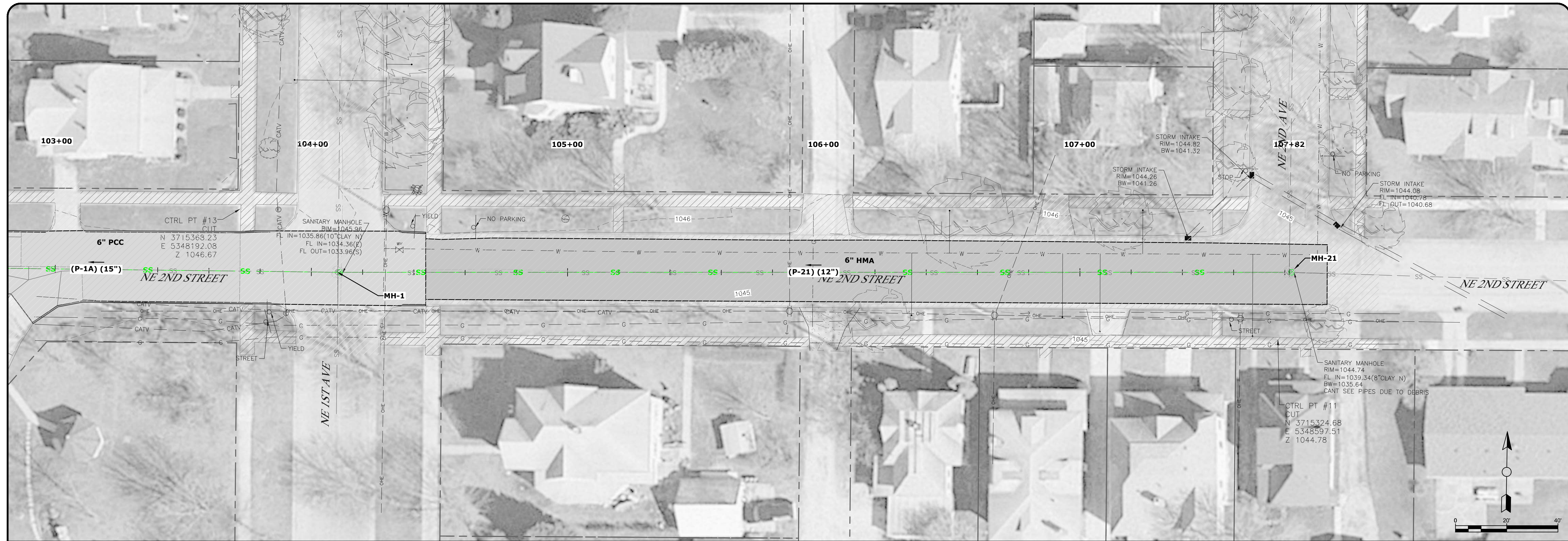
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 OELWEIN COLLECTION SYSTEM IMPROVEMENTS
 2021
 OELWEIN, IA

PROJECT NO.
 2003-20A

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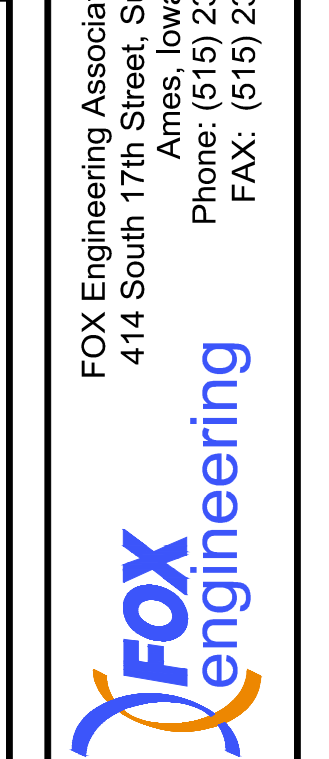
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REVISION	DATE	BY	DATE
DESIGNED	09/21		
DRAWN	09/21		
CHECKED			
LAST UPDATE: 9/21/21			

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SANITARY SEWER PLAN & PROFILE
 OELWEIN COLLECTION SYSTEM IMPROVEMENTS
 2021
 OELWEIN, IA

PROJECT NO.
2003-20A

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2021 SANITARY SEWER IMPROVEMENTS

ENGINEER'S OPINION OF PROBABLE PROJECT COST



Oelwein, Iowa
9/28/2021
2003-20A

SITE A - (NE 4th & 5th AVE)				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS	
ITEM NO.	BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
DIVISION 1 - GENERAL PROVISIONS & COVENANTS					
DIVISION 2 - EARTHWORK					
2.01	TOPSOIL STRIP, STOCKPILE, & REPREAD	LS	1	\$ 5,000.00	\$ 5,000.00
2.02	GRANULAR SUBBASE	TON	1,600	\$ 22.00	\$ 35,200.00
2.03	SUBGRADE PREPARATION, 12-INCH	SY	5,240	\$ 2.50	\$ 13,100.00
2.04	REMOVAL OF STRUCTURE, SANITARY MANHOLE	EA	7	\$ 1,000.00	\$ 7,000.00
2.05	REMOVAL OF ROADWAY BASE	CY	1,746	\$ 15.00	\$ 26,190.00
<i>Division Subtotal</i>					\$ 86,490.00
DIVISION 3 - TRENCH EXCAVATION & BACKFILL					
3.01	TRENCH FOUNDATION	TON	200	\$ 40.00	\$ 8,000.00
3.02	REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL	CY	100	\$ 20.00	\$ 2,000.00
3.03	TRENCH COMPACTION TESTING	LS	1	\$ 5,000.00	\$ 5,000.00
<i>Division Subtotal</i>					\$ 15,000.00
DIVISION 4 - SEWERS & DRAINS					
4.01	SANITARY SEWER GRAVITY MAIN, TRENCHED, 8-INCH	LF	60	\$ 80.00	\$ 4,800.00
4.02	SANITARY SEWER GRAVITY MAIN, TRENCHED, 12-INCH	LF	1,735	\$ 135.00	\$ 234,225.00
4.03	SANITARY SEWER SERVICE, PVC WYE & CONNECTION TO EXISTING	EA	30	\$ 1,500.00	\$ 45,000.00
4.04	CONNECT PROPOSED SANITARY PIPE TO EXISTING PIPE OR STRUCTURE	EA	6	\$ 1,500.00	\$ 9,000.00
4.05	SANITARY SEWER SERVICE, PVC	LF	600	\$ 90.00	\$ 54,000.00
4.06	BYPASS PUMPING	LS	1	\$ 50,000.00	\$ 50,000.00
<i>Division Subtotal</i>					\$ 397,025.00
DIVISION 5 - WATER MAINS & APPURTENANCES (NOT USED)					
DIVISION 6 - STRUCTURES FOR SANITARY & STORM SEWERS					
6.01	MANHOLE, SANITARY SEWER, SW-301, 48-INCH	EA	7	\$ 8,200.00	\$ 57,400.00
6.02	EXTERNAL DROP CONNECTION	EA	1	\$ 2,500.00	\$ 2,500.00
<i>Division Subtotal</i>					\$ 59,900.00
DIVISION 7 - STREETS & RELATED WORK					
7.01	PCC CURB AND GUTTER	LF	400	\$ 30.00	\$ 12,000.00
7.02	PAVEMENT, HMA, 6-INCH	SY	4,715	\$ 40.00	\$ 188,600.00
7.03	PAVEMENT, PCC, 6-INCH	SY	227	\$ 65.00	\$ 14,755.00
7.04	REMOVAL OF CURB & GUTTER	LF	400	\$ 10.00	\$ 4,000.00
7.05	DRIVEWAY, GRANULAR	TON	25	\$ 30.00	\$ 750.00
7.06	PAVEMENT REMOVAL	SY	4,942	\$ 8.00	\$ 39,537.78
<i>Division Subtotal</i>					\$ 259,642.78
DIVISION 8 - TRAFFIC CONTROL					
8.01	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 15,000.00	\$ 15,000.00
<i>Division Subtotal</i>					\$ 15,000.00
DIVISION 9 - SITE WORK & LANDSCAPING					
9.01	HYDRAULIC SEEDING, FERTILIZING, AND MULCHING - TYPE 1	AC	1	\$ 6,000.00	\$ 6,000.00
9.02	EROSION CONTROL MULCHING, HYDROMULCHING	AC	1	\$ 1,500.00	\$ 1,500.00
9.03	FILTER SOCK, 8-INCH	LF	200	\$ 4.00	\$ 800.00
9.04	FILTER SOCKS, REMOVAL	LF	200	\$ 1.00	\$ 200.00
<i>Division Subtotal</i>					\$ 8,500.00
DIVISION 10 - DEMOLITION (NOT USED)					
DIVISION 11 - MISCELLANEOUS					
11.01	MOBILIZATION	LS	1	\$ 45,000.00	\$ 45,000.00
11.02	MAINTENANCE OF POSTAL SERVICE	LS	1	\$ 1,000.00	\$ 1,000.00
11.03	MAINTENANCE OF SOLID WASTE COLLECTION	LS	1	\$ 1,500.00	\$ 1,500.00
<i>Division Subtotal</i>					\$ 47,500.00
CONSTRUCTION SUBTOTAL					\$ 889,057.78
CONTINGENCY (10%)					\$ 89,000.00
SIDEWALK RAMP CONTINGENCY					\$ 20,000.00
CONSTRUCTION CONTINGENCY (2%)					\$ 18,000.00
GEOTECH, FINAL DESIGN, & BIDDING					\$ 51,000.00
ADMIN, STAKING, RECORD PLANS					\$ 35,000.00
OBSERVATION					\$ 70,000.00
TOTAL PROJECT COSTS (Rounded)					\$ 1,170,000.00

PREPARED BY:
FOX ENGINEERING ASSOCIATES, INC.
AMES, IOWA

2021 SANITARY SEWER IMPROVEMENTS

ENGINEER'S OPINION OF PROBABLE PROJECT COST

Oelwein, Iowa
9/28/2021
2003-20A



SITE B - 2nd Street NE				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS	
ITEM NO.	BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
DIVISION 1 - GENERAL PROVISIONS & COVENANTS					
DIVISION 2 - EARTHWORK					
2.01	TOPSOIL STRIP, STOCKPILE, & REPREAD	LS	1	\$ 5,000.00	\$ 5,000.00
2.02	GRANULAR SUBBASE	TON	550	\$ 22.00	\$ 12,100.00
2.03	SUBGRADE PREPARATION, 12-INCH	SY	1,715	\$ 2.50	\$ 4,287.50
2.04	REMOVAL OF STRUCTURE, SANITARY MANHOLE	EA	3	\$ 1,000.00	\$ 3,000.00
2.05	REMOVAL OF ROADWAY BASE	EA	570	\$ 15.00	\$ 8,550.00
<i>Division Subtotal</i>					\$ 32,937.50
DIVISION 3 - TRENCH EXCAVATION & BACKFILL					
3.01	TRENCH FOUNDATION	TON	100	\$ 40.00	\$ 4,000.00
3.02	REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL	CY	100	\$ 20.00	\$ 2,000.00
3.03	TRENCH COMPACTION TESTING	LS	1	\$ 5,000.00	\$ 5,000.00
<i>Division Subtotal</i>					\$ 11,000.00
DIVISION 4 - SEWERS & DRAINS					
4.01	SANITARY SEWER GRAVITY MAIN, TRENCHED, 8-INCH	LF	40	\$ 80.00	\$ 3,200.00
4.02	SANITARY SEWER GRAVITY MAIN, TRENCHED, 12-INCH	LF	371	\$ 135.00	\$ 50,085.00
4.03	SANITARY SEWER GRAVITY MAIN, TRENCHED, 15-INCH	LF	309	\$ 160.00	\$ 49,440.00
4.03	SANITARY SEWER SERVICE, PVC WYE & CONNECTION TO EXISTING	EA	5	\$ 1,500.00	\$ 7,500.00
4.04	CONNECT PROPOSED SANITARY PIPE TO EXISTING PIPE OR STRUCTURE	EA	4	\$ 90.00	\$ 360.00
4.05	SANITARY SEWER SERVICE, PVC	LF	100	\$ 30.00	\$ 3,000.00
4.06	SANITARY SEWER GRAVITY MAIN, TRENCHLESS, 15-INCH	LF	100	\$ 850.00	\$ 85,000.00
4.07	BYPASS PUMPING	LS	1	\$ 20,000.00	\$ 20,000.00
4.08	BORE & JACK PIT	LS	1	\$ 15,000.00	\$ 15,000.00
<i>Division Subtotal</i>					\$ 233,585.00
DIVISION 5 - WATER MAINS & APPURTENANCES (NOT USED)					
DIVISION 6 - STRUCTURES FOR SANITARY & STORM SEWERS					
6.01	MANHOLE, SANITARY SEWER, SW-301, 48-INCH	EA	3	\$ 8,200.00	\$ 24,600.00
6.02	EXTERNAL DROP CONNECTION	EA	1	\$ 2,500.00	\$ 2,500.00
6.03	CONNECTION TO EXISTING MANHOLE	EA	1	\$ 3,500.00	\$ 3,500.00
<i>Division Subtotal</i>					\$ 30,600.00
DIVISION 7 - STREETS & RELATED WORK					
7.01	PCC CURB AND GUTTER	LF	50	\$ 30.00	\$ 1,500.00
7.02	PAVEMENT, HMA, 6-INCH	SY	937	\$ 40.00	\$ 37,471.11
7.03	PAVEMENT, PCC, 6-INCH	SY	776	\$ 65.00	\$ 50,447.22
7.04	REMOVAL OF CURB & GUTTER	LF	50	\$ 10.00	\$ 500.00
7.05	DRIVEWAY, GRANULAR	TON	10	\$ 30.00	\$ 300.00
7.06	PAVEMENT REMOVAL	SY	1,713	\$ 8.00	\$ 13,703.11
<i>Division Subtotal</i>					\$ 103,921.44
DIVISION 8 - TRAFFIC CONTROL					
8.01	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 15,000.00	\$ 15,000.00
<i>Division Subtotal</i>					\$ 15,000.00
DIVISION 9 - SITE WORK & LANDSCAPING					
9.01	HYDRAULIC SEEDING, FERTILIZING, AND MULCHING - TYPE 1	AC	0.50	\$ 6,000.00	\$ 3,000.00
9.02	EROSION CONTROL MULCHING, HYDROMULCHING	AC	0.50	\$ 1,500.00	\$ 750.00
9.03	FILTER SOCK, 8-INCH	LF	200	\$ 4.00	\$ 800.00
9.04	FILTER SOCKS, REMOVAL	LF	200	\$ 1.00	\$ 200.00
<i>Division Subtotal</i>					\$ 4,750.00
DIVISION 10 - DEMOLITION (NOT USED)					
DIVISION 11 - MISCELLANEOUS					
11.01	MOBILIZATION	LS	1	\$ 25,000.00	\$ 25,000.00
11.02	MAINTENANCE OF POSTAL SERVICE	LS	1	\$ 1,000.00	\$ 1,000.00
11.03	MAINTENANCE OF SOLID WASTE COLLECTION	LS	1	\$ 1,500.00	\$ 1,500.00
<i>Division Subtotal</i>					\$ 27,500.00
CONSTRUCTION SUBTOTAL					\$ 459,293.94
CONTINGENCY (10%)					\$ 46,000.00
SIDEWALK RAMP CONTINGENCY					\$ 35,000.00
CONSTRUCTION CONTINGENCY (2%)					\$ 9,000.00
STORM SEWER CONTINGENCY					\$ 15,000.00
GEOTECH, FINAL DESIGN, & BIDDING					\$ 30,000.00
ADMIN, STAKING, RECORD PLANS					\$ 21,000.00
OBSERVATION					\$ 50,000.00
TOTAL PROJECT COSTS (Rounded)					\$ 670,000.00

PREPARED BY:
FOX ENGINEERING ASSOCIATES, INC.
AMES, IOWA