

MEMORANDUM

Date: March 28, 2019

To: Board of Directors
Cherry Hills North Metropolitan District

From: Chris Purrington, P.E.

Re: 2019 Sanitary Sewer Maintenance Program

2018 SANITARY SEWER MAINTENANCE

The District's Sanitary Sewer Maintenance Program consists of a two (2) year jet cleaning and video cycle. The District is divided into two (2) basins, the East Basin (6,792 linear feet) and the West Basin (5,198 linear feet). During even numbered years, the East Basin is jet cleaned and the West Basin is inspected by video. During odd numbered years, the West Basin is jet cleaned and the East Basin is inspected by video.

The 2019 Sanitary Sewer Maintenance Program was completed by Dale's Environmental Services (DES) and reviewed by our office. The following is a summary of the 2019 Program.

1. Jet Cleaning Program

The 2019 Jet Cleaning Program consisted of cleaning the West Basin. DES completed the cleaning on January 9, 2019.

2. Video Program

The 2019 Video Program consisted of video inspection of the East Basin. DES completed the video inspection on January 21, 2019. Structural defects with corresponding severity are identified on the attached Pipe Defects Map.

Summary

Below is a summary of the 2019 Video Program:

- **Root Removal**

Root removal was performed on 474 LF of main line in the East Basin. The pipe segments listed below are the lines that DES cleared of problematic roots.

Upstream MH	Downstream MH	Street Name	Pipe Length (LF)
MH 3.3.4	MH 3.3.3	5420 Nassau Circle East	300
MH 3.3.7B	MH 3.3.7A	Easement	72
MH 3.8	MH 3.7	5420 Nassau Circle East	102
	Total LF		474

DES charges \$0.90 /LF (\$0.40 /LF for root cut, \$0.50 /LF for inspection), therefore the estimated cost for rootsaw is \$426.60.

- **Roots in Service Lines**

Four (4) service connections with roots were identified. We recommend that letters be provided, including photos of the blocked service lines, as a courtesy to the homeowner. The addresses with root blockage are listed below.

Service Line Addresses
4041 South Holly Street
5420 Nassau Circle East
5400 Nassau Circle East
3991 Holly Way

- **Recommended Pipe Repairs**

Six (6) sewer line segments contain defects that warrant repair.

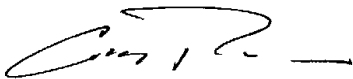
Upstream MH	Downstream MH	Street Name	Pipe Length (LF)
MH 14	MH 13	Nassau Circle East	400
MH 5	MH 6	Nassau Circle West	151
MH 3.8	MH 3.7	Sanford Circle East	102
MH 3.3.11	MH 3.3.10	Nassau Circle East	294
MH 3.3.7	MH 3.3.6	Nassau Circle East	104
MH 3.3.6	MH 3.3.5	Nassau Circle East	231
	Total LF		1,282

Cracks in these lines have progressed to a higher grade from previous inspections. However, the defects do not appear to be severe enough to cause the pipe to collapse. As a result, repairing these lines is recommended within the next 2 – 3 years. We estimate \$34 / LF for the cured-in-place place repair for a total of **\$43,600**.

For reference, the pricing from Insituform for the 2017 CIPP was \$28.70 LF for repair of 2,156 LF of pipe for a total of \$61,876.

Please do not hesitate to contact me with any questions or if you need additional information.

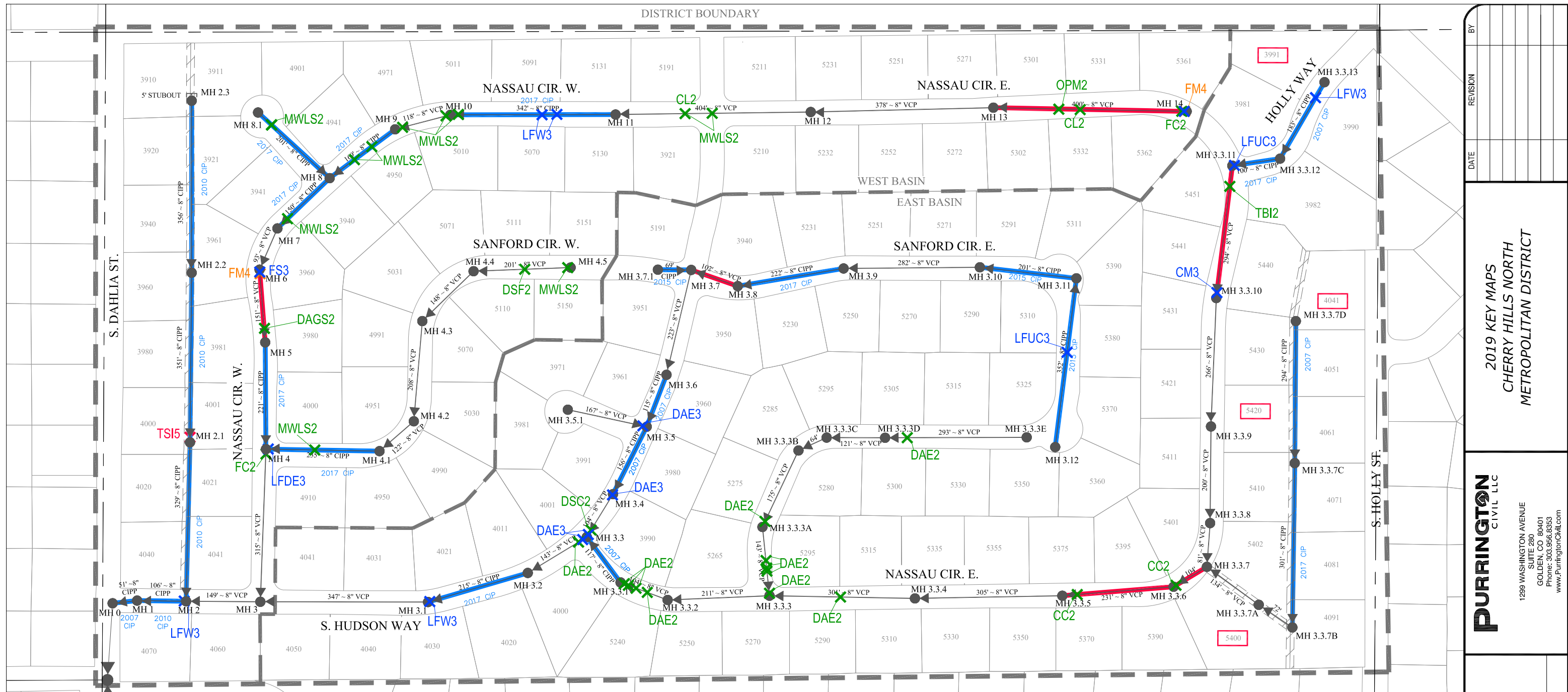
Sincerely,
PURRINGTON CIVIL, LLC

A handwritten signature in black ink, appearing to read "Chris Purrington", with a horizontal line extending to the right.

Chris Purrington, P.E.

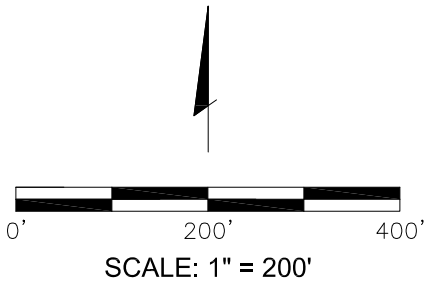
Attachments:

- Pipe Defects & Root Maps



PIPE DEFECTS LEGEND

CODE	CODE	STRUCTURAL GRADE
BPVV = BROKEN PIPE VOID VISIBLE	FS = FRACTURE SPIRAL	FC3
CH(#) = CRACK HINGE (# OF CRACKS)	JOL = JOINT OFFSET LARGE	STRUCTURAL GRADE
CC = CRACK CIRCUMFERENTIAL	LFBB = LINING FAILURE BLISTERED	1 = MINOR (NOT SHOWN)
CL = CRACK LONGITUDINAL	LFCCS = " CONNECTION CUT SHIFTED	2 = MINOR TO MODERATE
CM = CRACK MULTIPLE	LFDD = LINING FAILURE DETACHED	3 = MODERATE
CS = CRACK SPIRAL	LFDE = LINING FAILURE DEFECTIVE END	4 = SIGNIFICANT
DH = DEFORMED HORIZONTALLY	LFUC = LINING FAILURE UNDERCUT CONNECTION	5 = MOST SIGNIFICANT
DAE = DEPOSITS ATTACHED ENCRUSTATION	LFW = LINING FAILURE WRINKLED	
DAGS = DEPOSITS ATTACHED GREASE	MWLS = MISC WATER LEVEL SAG	
DSF = DEPOSITS SETTLED FINE	MWM = MISC WATER MARK	
DSC = DEPOSITS SETTLED COMPACTED	OPM = OBSTACLE PIPE MATERIAL	
ISSR = INTRUDING SEALING RING	TBC = TAP BREAK-IN CAPPED	
FC = FRACTURE CIRCUMFERENTIAL	TBI = TAP BREAK-IN INTRUDING	
FL = FRACTURE LONGITUDINAL	TSI = TAP SADDLE INTRUDING	
FM = FRACTURE MULTIPLE		
		CIPP =
		REPAIR =
		ROOTS IN SERVICE =



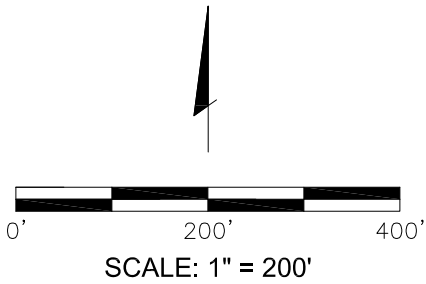
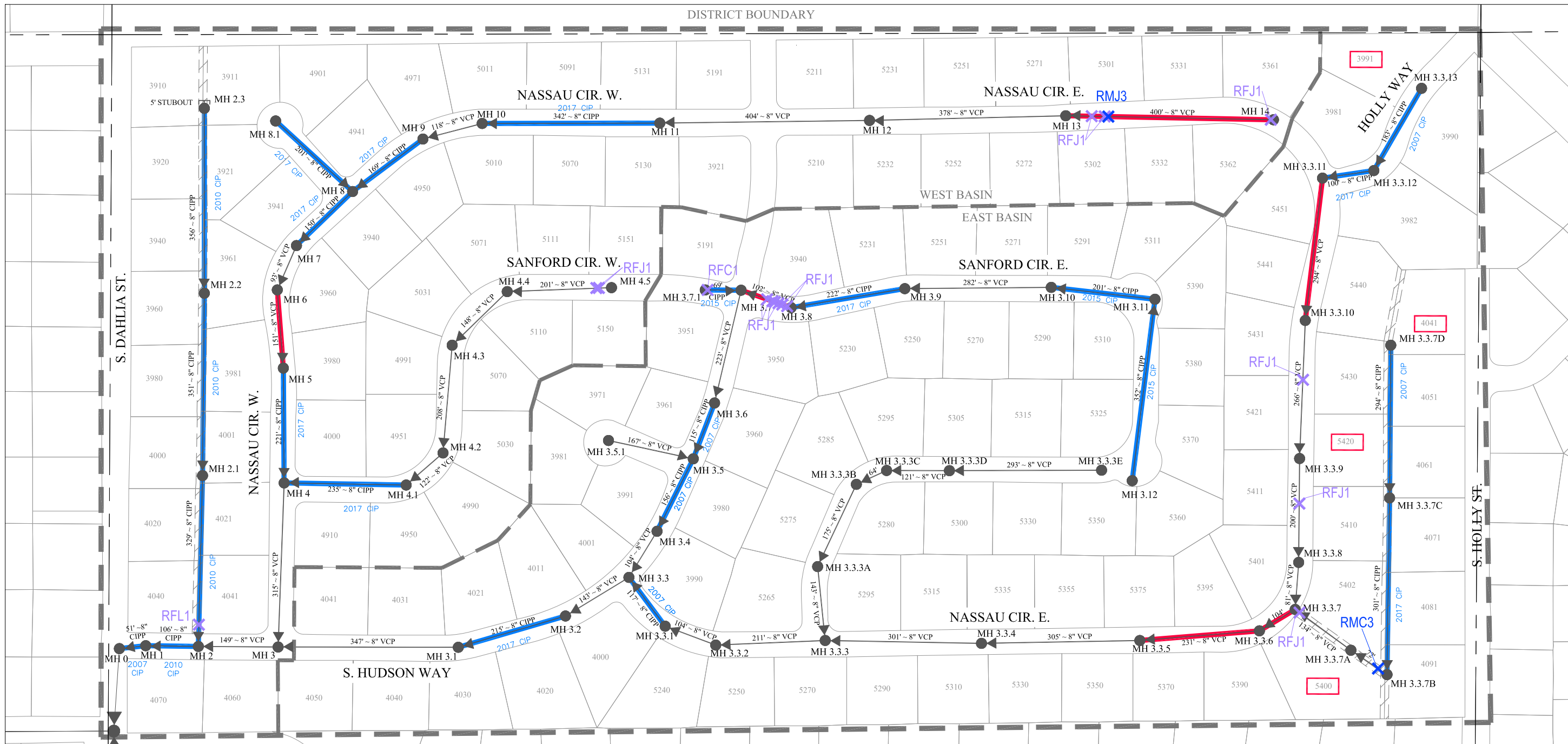
CHERRY HILLS NORTH METROPOLITAN DISTRICT

REVISION	BY
DATE	

2019 KEY MAPS
CHERRY HILLS NORTH
METROPOLITAN DISTRICT

PURRINGTON
CIVIL LLC
1289 WASHINGTON AVENUE
SUITE 260
GOLDEN, CO 80401
Phone: 303.956.8363
www.PurrringtonCivil.com

DEFECTS MAP
SCALE: AS NOTED



ROOTS LEGEND		STRUCTURAL GRADE	
CODE	CODE	1 = MINOR	CIPP = —
RBB = ROOT BALL BARREL	RMB = ROOT MEDIUM BARREL	2 = MINOR TO MODERATE	REPAIR = —
RBC = ROOT BALL CONNECTION	RMC = ROOT MEDIUM CONNECTION	3 = MODERATE	ROOTS IN SERVICE =
RBL = ROOT BALL LATERAL	RML = ROOT MEDIUM LATERAL	4 = SIGNIFICANT	
RFB = ROOT FINE BARREL	RMJ = ROOT MEDIUM JOINT		
RFC = ROOT FINE CONNECTION	RTB = ROOT TAP BARREL		
RFL = ROOT FINE LATERAL	RTC = ROOT TAP CONNECTION		
RFJ = ROOT FINE JOINT	RTL = ROOT TAP LATERAL		

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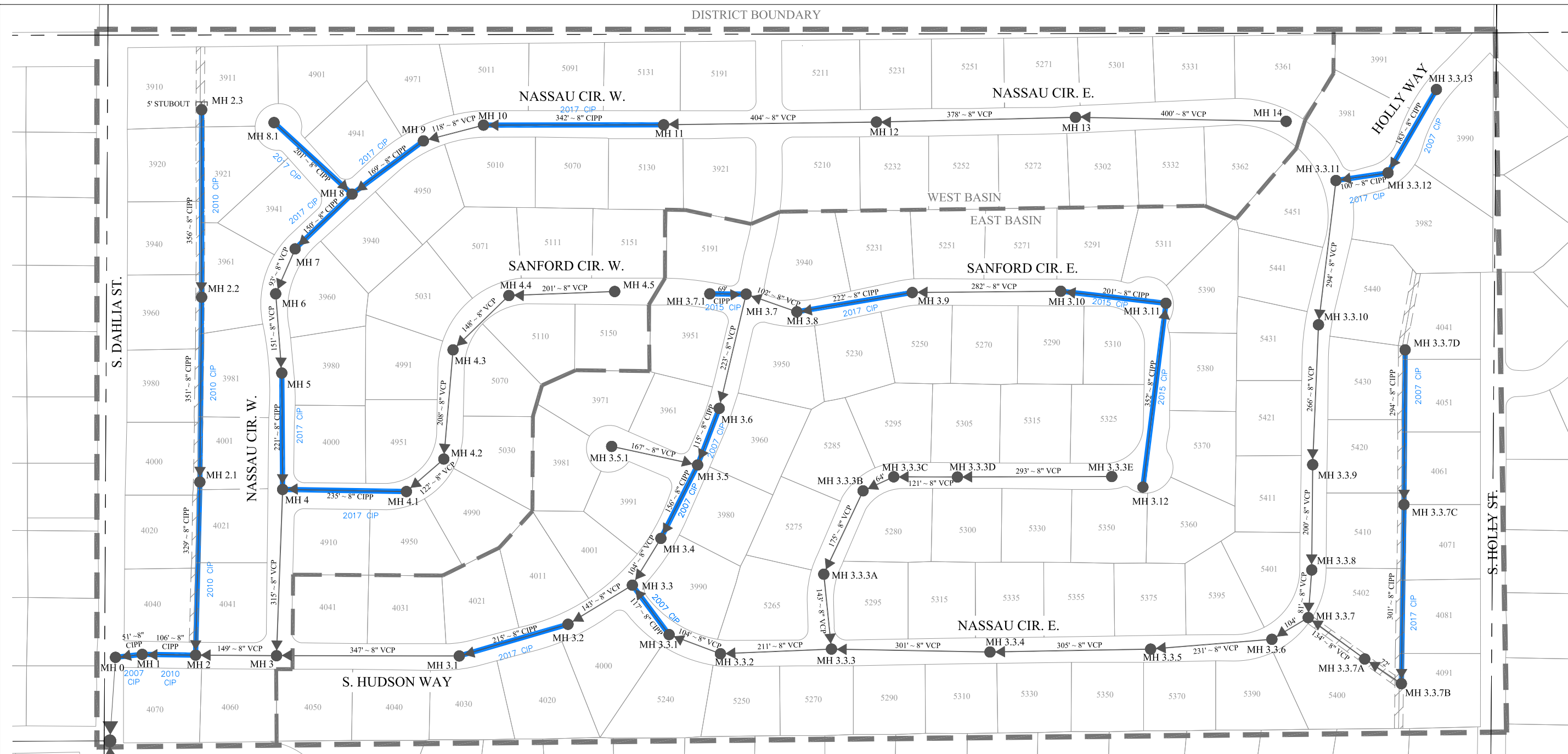
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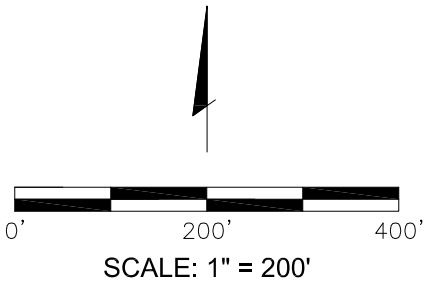
ROOTS MAP

SCALE: AS NOTED



CURED IN PLACE PIPE LEGEND

	<i>LINEAR FOOTAGE</i>	<i>SEGMENTS</i>	<i>PERCENTAGE</i>
EXISTING CIPP	4,836 LF	23	40.3%
DISTRICT PIPE TOTAL	11,990 LF	59	100%



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CIPP LINING
EXHIBIT
 SCALE: AS NOTED