PURRINGTON CIVIL, LLC

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MEMORANDUM

Date: March 14, 2023

To: Board of Directors
Cherry Hills North Metropolitan District

From: Chris Purrington, P.E.

Re: 2023 Sanitary Sewer Maintenance Program

2023 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 2023 Sanitary Sewer Maintenance Program was completed by Dale's Environmental Services (DES) and reviewed by our office. The following is a summary of the 2023 Program.

1. **Jet Cleaning Program**
   The 2023 Jet Cleaning Program consisted of cleaning the West Basin. DES completed the cleaning January 2023.

2. **Video Program**
   The 2023 Video Program consisted of video inspection of the East Basin. DES completed the video inspection January 2023.

Video Inspection Summary

Below is a summary of the 2023 Video Program

- **Roots**

  Overall roots in the sewer mains were minimal. However, there were three (3) lines in the East Basin where roots were evident that could potentially cause a blockage. As a result, we recommend root cutting, re-cleaning, and re-videoing the following three (3) lines.

Street	MH	MH	Pipe Length
Nassau Circle E	MH 3.3.2	MH 3.3.1	104
Easement	MH 3.3.7B	MH 3.3.7A	72
Sanford Circle E	MH 3.3.10	MH 3.3.9	266
		Total Length	**442**

  We will coordinate with DES for the work.

- **Roots in Service Lines**

  Thirteen (13) 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
5275 Sanford Circle East
5285 Sanford Circle East
5305 Sanford Circle East
5325 Sanford Circle East
5350 Sanford Circle East
5380 Sanford Circle East
3991 Holly Way*
5430 Nassau Circle East
5402 Nassau Circle East
5400 Nassau Circle East
4051 South Holly Street
4071 South Holly Street*
4081 South Holly Street

  * These addresses were also identified with root blockage as part of the 2021 Maintenance Review

- **Pipe Repairs**
  We have updated the Pipe Defects Map to include structural defects with corresponding severity. No major defects were identified that warrant immediate repair. However, based on our review, one additional line was added to the Future CIPP Project Schedule. This line is in Nassau Circle East between Manholes 3.3.3 and 3.3.4. There is a crack midway down the pipe segment that appears to have worsened from the 2021 video review. Below is a table of our future pipe repair recommendations.

Future CIPP Project Schedule

Zone	Street	MH	MH	Pipe Length
W	Nassau Circle E/W	MH-12	MH-11	404
W	Nassau Circle W	MH-4	MH-3	315
E	Nassau Circle East	MH 3.3.4	MH 3.3.3	301
			Total Length	**1,020**

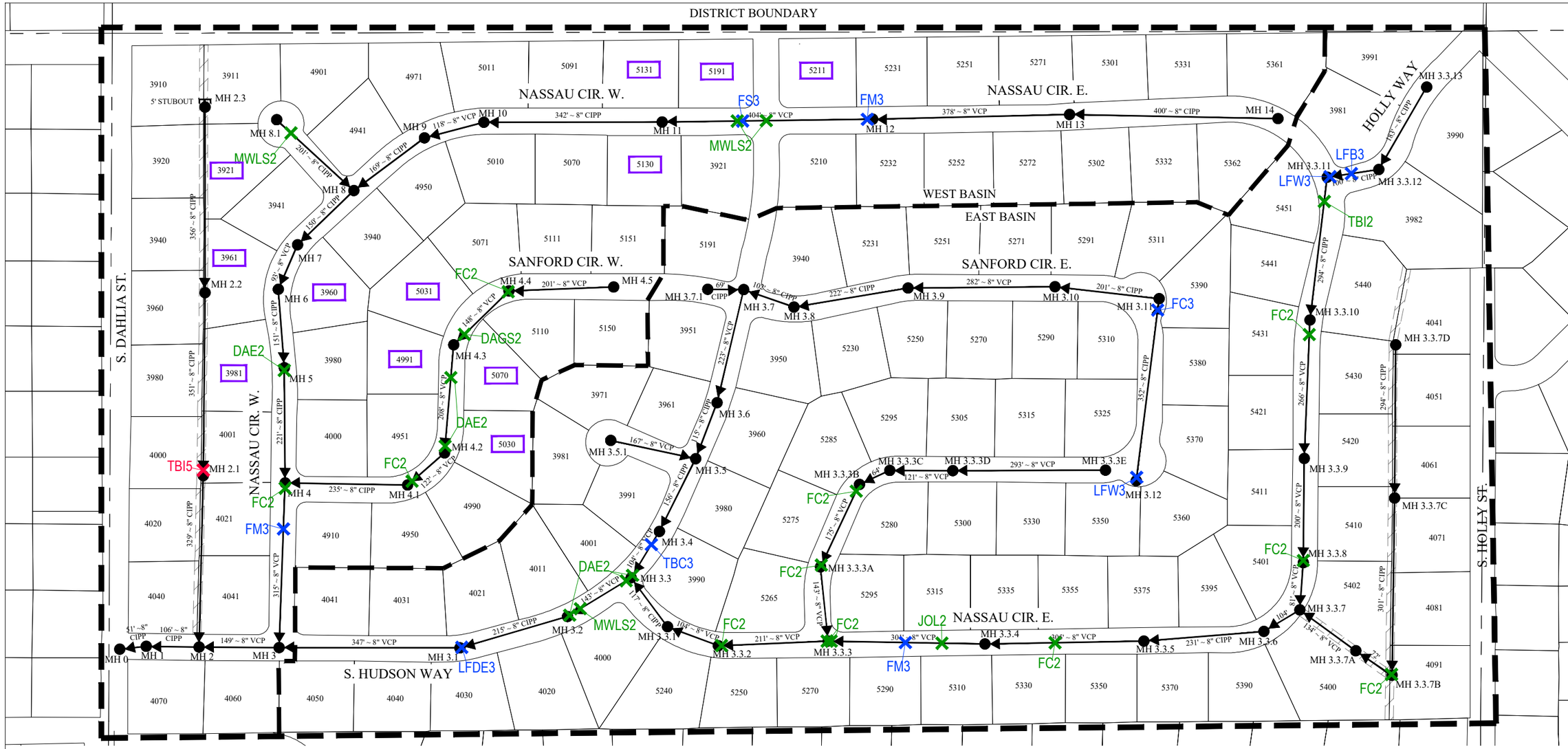
Although no repairs are recommended for this year, I do expect to budget for a project in 2024 to repair the above lines.

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

Sincerely,
PURRINGTON CIVIL, LLC

Chris Purrington, P.E.

Attachments:
- Pipe Defects Map
- Root Infiltration Map
- CIPP Lining Map



PIPE DEFECTS LEGEND

CODE — STRUCTURAL GRADE (FC3)

CODE

- BPVV = BROKEN PIPE VOID VISIBLE
- CH(#) = CRACK HINGE (# OF CRACKS)
- CC = CRACK CIRCUMFERENTIAL
- CL = CRACK LONGITUDINAL
- CM = CRACK MULTIPLE
- CS = CRACK SPIRAL
- DH = DEFORMED HORIZONTALLY
- DAE = DEPOSITS ATTACHED ENCRUSTATION
- DAGS = DEPOSITS ATTACHED GREASE
- DSF = DEPOSITS SETTLED FINE
- DSC = DEPOSITS SETTLED COMPACTED
- ISSR = INTRUDING SEALING RING
- FC = FRACTURE CIRCUMFERENTIAL
- FL = FRACTURE LONGITUDINAL
- FM = FRACTURE MULTIPLE

CODE

- FS = FRACTURE SPIRAL
- JOL = JOINT OFFSET LARGE
- LFB = LINING FAILURE BLISTERED
- LFCCS = " CONNECTION CUT SHIFTED
- LFD = LINING FAILURE DETACHED
- LFDE = LINING FAILURE DEFECTIVE END
- LFUC = LINING FAILURE UNDERCUT CONNECTION
- LFW = LINING FAILURE WRINKLED
- MWLS = MISC WATER LEVEL SAG
- MWM = MISC WATER MARK
- OPM = OBSTACLE PIPE MATERIAL
- TBC = TAP BREAK-IN CAPPED
- TBI = TAP BREAK-IN INTRUDING
- TSI = TAP SADDLE INTRUDING

STRUCTURAL GRADE

- 1 = MINOR (NOT SHOWN)
- 2 = MINOR TO MODERATE
- 3 = MODERATE
- 4 = SIGNIFICANT
- 5 = MOST SIGNIFICANT

DEFECTIVE SERVICE =

CHERRY HILLS NORTH METROPOLITAN DISTRICT

DATE	REVISION	BY

2023 KEY MAPS
CHERRY HILLS NORTH
METROPOLITAN DISTRICT

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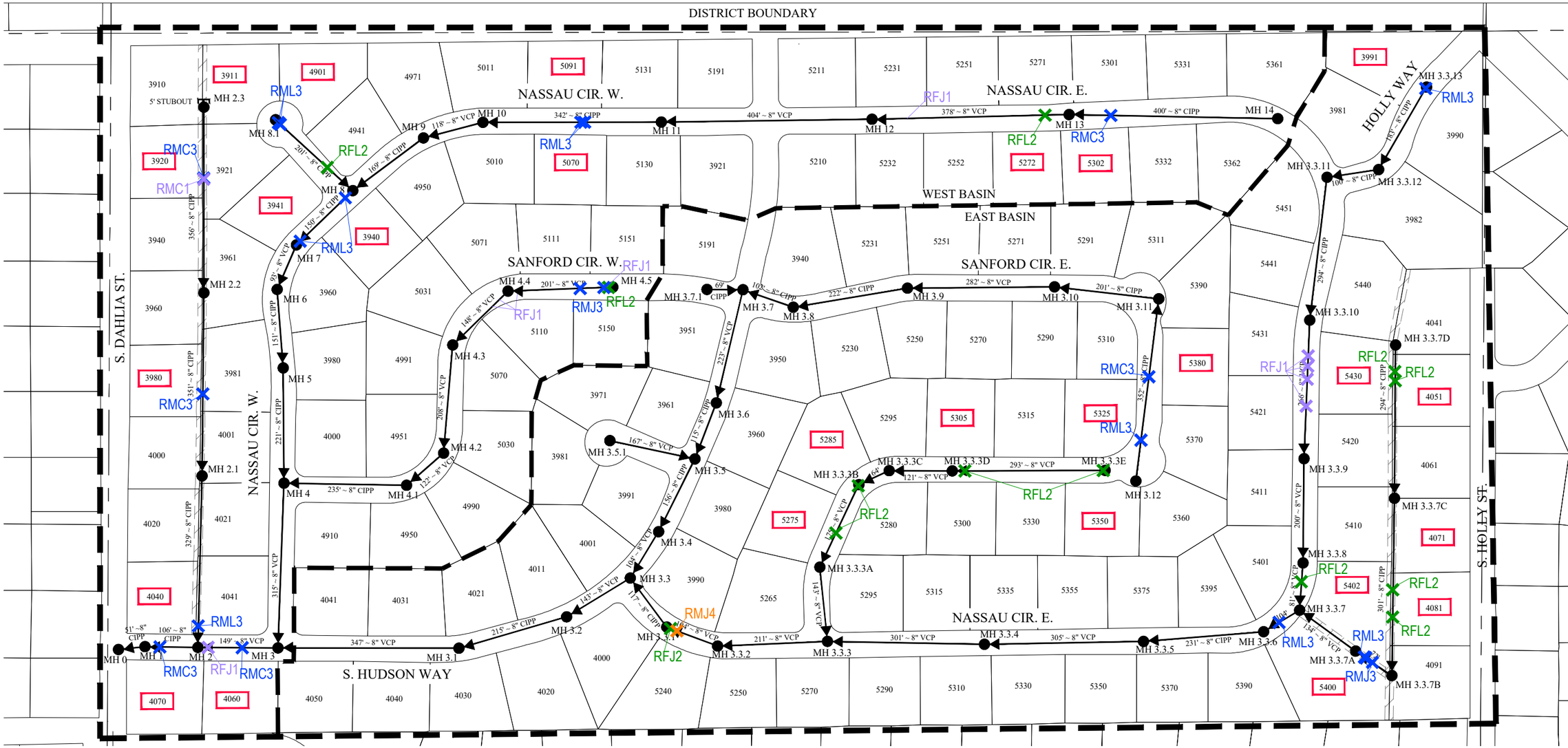
2023 DEFECTS MAP

SCALE: AS NOTED



ROOTS LEGEND

CODE — ROOT GRADE

RMJ3

CODE	CODE	
RBB = ROOT BALL BARREL	RMB = ROOT MEDIUM BARREL	
RBC = ROOT BALL CONNECTION	RMC = ROOT MEDIUM CONNECTION	
RBL = ROOT BALL LATERAL	RML = ROOT MEDIUM LATERAL	
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	ROOTS IN SERVICE =

STRUCTURAL GRADE

1 = MINOR

2 = MINOR TO MODERATE

3 = MODERATE

4 = SIGNIFICANT

0' 200' 400'

SCALE: 1" = 200'

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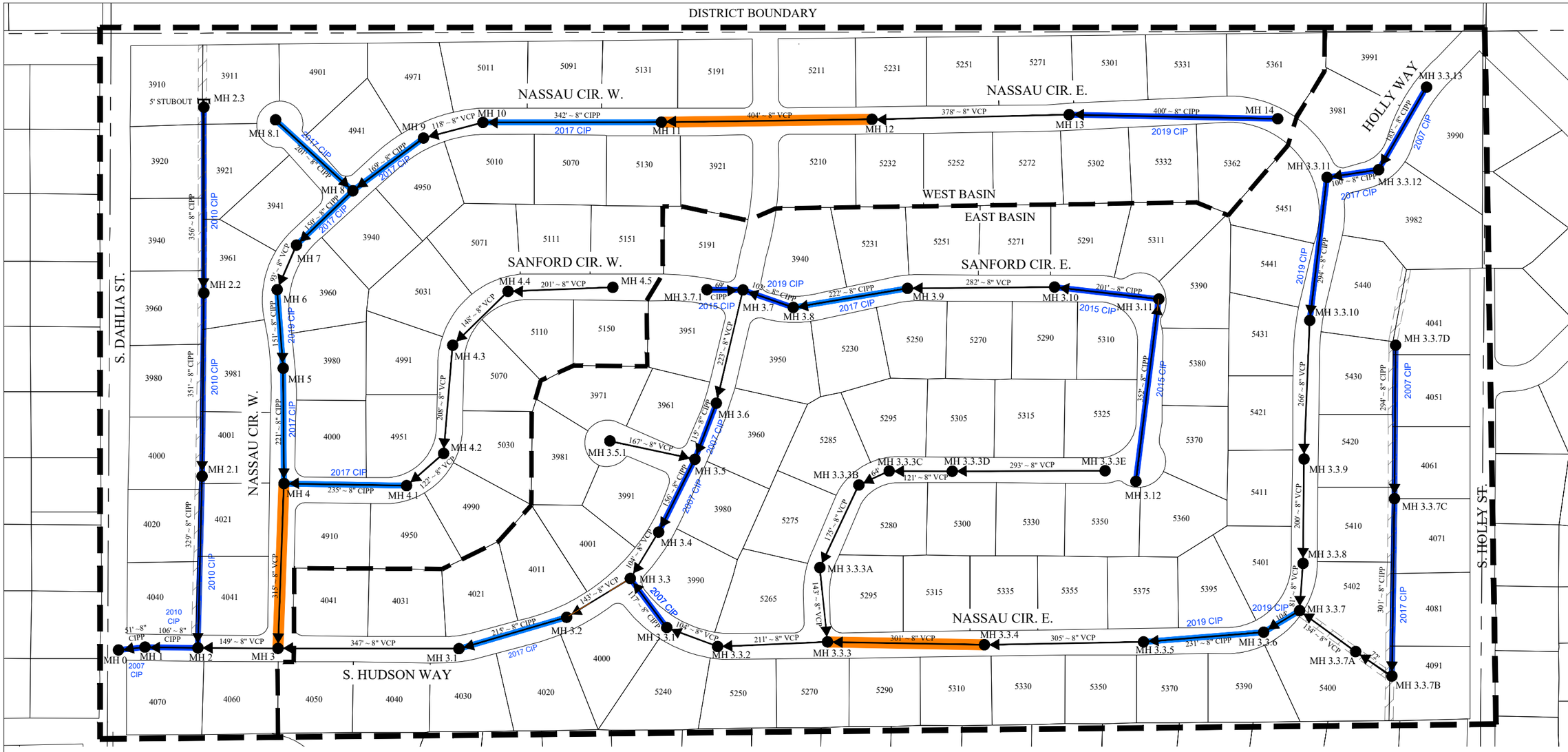
ROOTS MAP

SCALE: AS NOTED



CURED-IN-PLACE PIPE (CIPP) LEGEND

	LINEAR FOOTAGE	SEGMENTS	PERCENTAGE
EXISTING 8" VCP	5,872 LF	30	49.0%
CIPP	6,118 LF	29	51.0%
TOTAL	11,990 LF	59	100%

CURED-IN-PLACE PIPE (CIPP) LEGEND

	LINEAR FOOTAGE	SEGMENTS
FUTURE REPAIRS	1,020 LF	3

0' 200' 400'

SCALE: 1" = 200'

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2023 KEY MAPS
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CIPP LINING EXHIBIT

SCALE: AS NOTED