

MEMORANDUM

Date: June 13, 2017

To: Board of Directors, Cherry Hills North Metropolitan District
Darcy Beard, Manager

From: Chris Purrington, P.E.

Re: 2017 Sanitary Sewer Maintenance Review

2017 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 (lf)) and the West Basin (5,198 lf). East Basin is jet cleaned and the West Basin is videoed during even numbered years and the West Basin is jet cleaned and the East Basin is videoed during odd numbered years.

The 2017 Sanitary Sewer Maintenance Program was completed by Dale's Environmental Services (DES). The following is a summary of the 2017 Program.

1. Jet Cleaning Program

West Basin – 5,198 lf. DES completed the jet cleaning on March 17, 2017.

2. Video Program

East Basin – 6,792 lf. DES completed the video inspection on March 23, 2017.

- Structural defects with corresponding severity are presented on the attached Pipe Defects Map.
- Roots found with corresponding severity are presented on the attached Roots Map.

3. Root Removal

DES was directed to root cut all sewer lines where roots were found from the video inspection. 625 lf of sewer line over three (3) pipe segments were cut and re-videoed on March 23, 2017. A summary of the root removal is as follows:

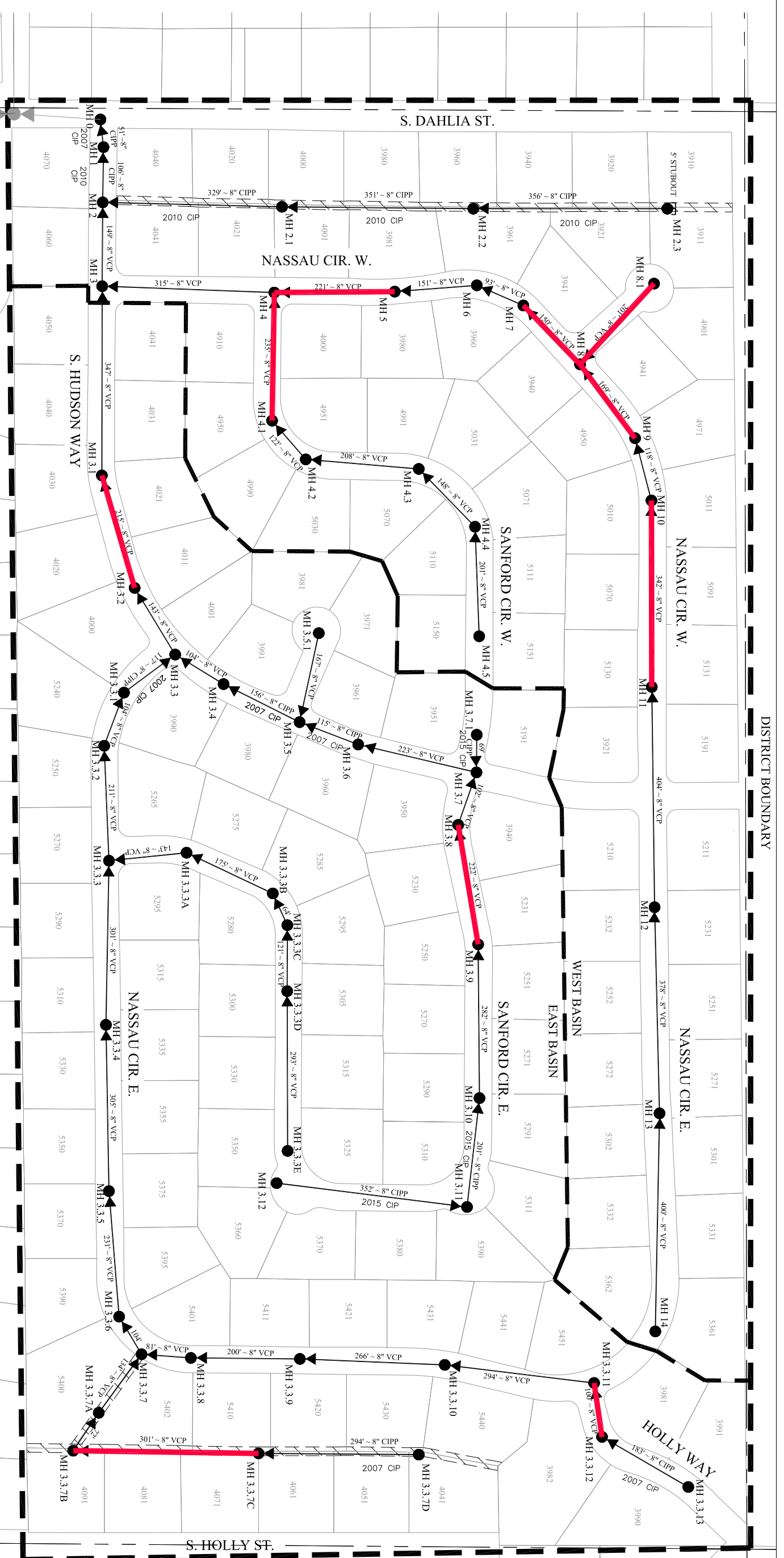
Upstream MH	Downstream MH	Pipe Length (lf)
MH 3.3.7C	MH 3.3.7B	301
MH 3.8	MH 3.7	102
MH 3.9	MH 3.8	222
	Total lf	625'

DES charges \$0.90 /lf, therefore the cost for the root removal was \$562.50.

FUTURE CAPITAL IMPROVEMENT PROJECT – CURED-IN-PLACE PIPE

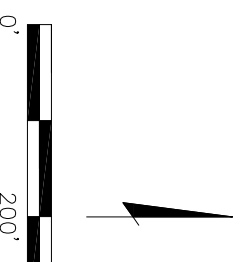
Two (2) pipe segments have been identified in the 2017 video review as having severe defects that warrant immediate repair. In addition to the eight (8) pipe segments previously identified in 2016, it is our recommendation that all ten (10) pipe segments (2,156 lf) be rehabilitated via cured-in-place pipe. It is also our recommendation that some of the pipe segments be root cut prior to lining. Given the additional root cutting, the estimated cost, based on recent projects with similar scope, is about \$33 / lf or \$71,150 in total.

Please refer the attached Future CIPP Lining Exhibit.



FUTURE CURED IN PLACE PIPE LEGEND

	FUTURE CIPP
	LINEAR FOOTAGE
	SEGMENTS
	2,156 LF
	10



SCALE: 1" = 200'

CHERRY HILLS NORTH METROPOLITAN DISTRICT

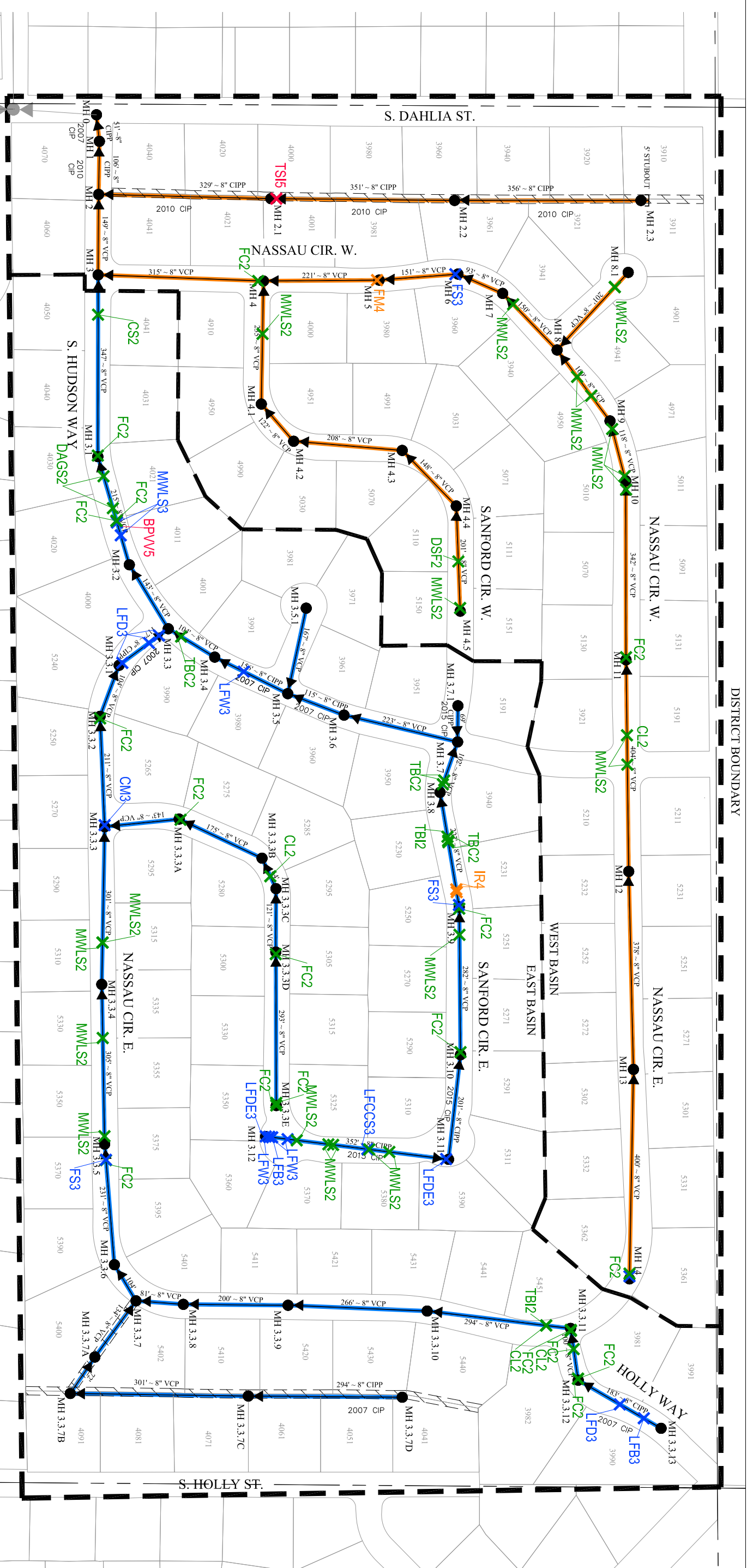
DATE	REVISION	BY

2017 KEY MAPS
CHERRY HILLS NORTH
METROPOLITAN DISTRICT

PURRINGTON
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1299 WASHINGTON AVENUE
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GOLDEN, CO 80401
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www.PurringtonCivil.com

FUTURE
CIPP LINING
EXHIBIT

SCALE: AS NOTED



DISTRICT BOUNDARY

PIPE DEFECTS LEGEND

CODE	DESCRIPTION
BPV#	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 ENCROUSTATION
DAGS	DEPOSITS ATTACHED GREASE
DSF	DEPOSITS SETTLED FINE
E	ENCROUSTATION
ISSR	INTRUDING SEALING RING
FC	FRACTURE CIRCUMFERENTIAL
FL	FRACTURE LONGITUDINAL
FM	FRACTURE MULTIPLE
FS	FRACTURE SPIRAL
JOL	JOINT OFFSET LARGE
LFB	LINING FAILURE BUSTED
LFCSS	LINING FAILURE CONNECTION CUT SHIFTED
LFD	LINING FAILURE DETACHED
LFDE	LINING FAILURE DEFECTIVE END
LFDL	LINING FAILURE DELAMINATING
LFW	LINING FAILURE WRINKLED
MWLS	MISC WATER LEVEL SAG
MMW	MISC WATER MARK
OPM	OBSTACLE PIPE MATERIAL
TBC	TAP BREAK-IN CAPPED
TBI	TAP BREAK-IN INTRUDING
TSI	TAP SADDLE INTRUDING

STRUCTURAL GRADE

CODE	DESCRIPTION
FC3	STRUCTURAL GRADE
1	MINOR (NOT SHOWN)
2	MINOR TO MODERATE
3	MODERATE
4	SIGNIFICANT
5	MOST SIGNIFICANT

MAINTENANCE LEGEND

VIDEO	JET CLEANING
5,198 LF	2018
6,792 LF	2017

CHERRY HILLS NORTH METROPOLITAN DISTRICT



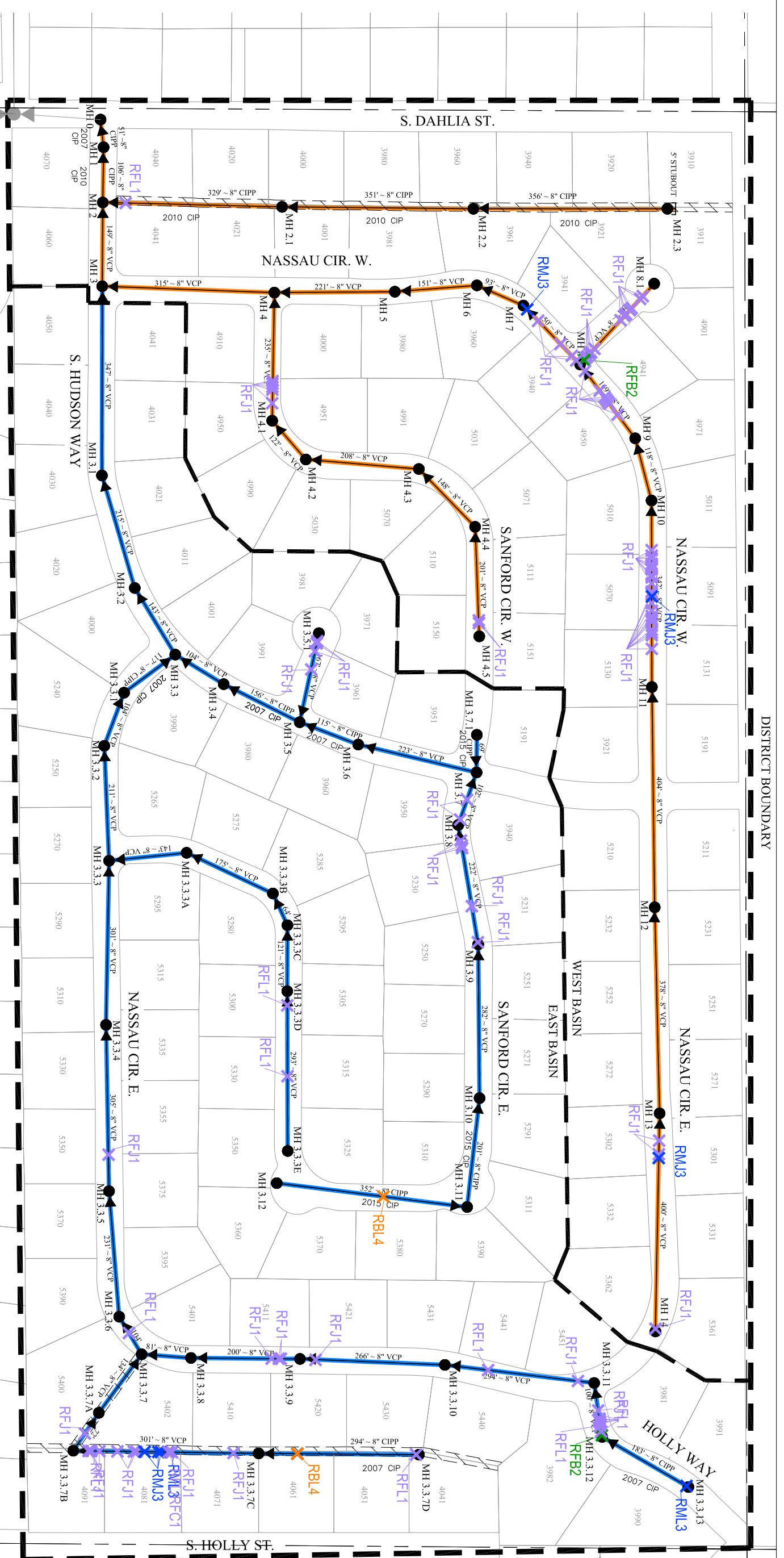
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PIPE DEFECTS MAP

SCALE AS NOTED



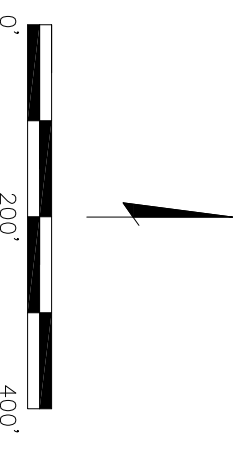
DISTRICT BOUNDARY

ROOTS LEGEND

- | | |
|----------------------------|------------------------------|
| 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 | RMU = ROOT MEDIUM JOINT |
| RFC = ROOT FINE CONNECTION | RTB = ROOT TAP BARREL |
| RFL = ROOT FINE LATERAL | RTC = ROOT TAP CONNECTION |
| RFLJ = ROOT FINE JOINT | RTL = ROOT TAP LATERAL |

MAINTENANCE LEGEND

- | | | |
|------------------|----------|--------------|
| STRUCTURAL GRADE | VIDEO | JET CLEANING |
| 1 = MINOR | 5,198 LF | 2018 |
| 2 = MODERATE | 6,792 LF | 2017 |
| 3 = MODERATE | | 2017 |
| 4 = SIGNIFICANT | | 2018 |



SCALE: 1" = 200'

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ROOTS MAP

SCALE: AS NOTED