



Drainage Work Order Request For Repair

Hardin County

Date: 3/31/2020

Work Order #: WO00000290

Drainage District: DDs\DD 14 (51027)

Sec-Twp-Rge: 34-88-22 **Qtr Sec:** SW NE & NW SE

Location/GIS: 88-22-34-200-004

Requested By: David Sweeney

Contact Phone: (641) 373-4340

Contact Email: _____

Landowner (if different): Cynthia loger

Description: DD 14- 2 blowouts in waterway, 5' blowout N of drive is 4' deep w broken VCP tile in base, 3' blowout S of drive lane is 3' deep w broken VCP tile in base. Contractor should enter through the farmstead & drive down the lane to back of property.

Repair labor, materials and equipment: _____

Repaired By: _____ **Date:** _____

Please reference work order # and send statement for services to:

Hardin County Auditor's Office
Attn: Drainage Clerk
1215 Edgington Ave, Suite 1
Eldora, IA 50627
Phone (641) 939-8111
Fax (641) 939-8245

For Office Use Only

Approved: _____ **Date:** _____



Drainage Work Order Request For Repair

Hardin County

Date **3/31/2020** Work Order # _____
 District # **#14** Lateral _____ Main Tile _____ Fund # _____
 Township _____ Section **34** Twp **88** Rge **22** Qtr Sec **SW NE & NW SE**
 Repair Requested By **David Sweeney**
 Address **21547 Hwy S27, Alden, IA 50006 (also the repair location)** Phone **641-373-4340**
 Landowner **Cynthia loerger**
 Address **19672 Hwy D15, Iowa Falls, IA 50126** Phone **641-640-2191**

Request Taken By _____

Available for Repair Now? Yes Date Available _____

Problem Description **Two blowouts in waterway:
 Blowout north of drive lane is 5 feet in diameter and 4 feet deep with broken VCP tile in the base.
 Blowout south of drive lane is 3 feet in diameter and 3 feet deep with broken VCP tile in the base.
 Contractor should enter through the farmstead and drive down the lane to the back of the property.**

Repair labor, materials and equipment _____

Potential Wetlands? Yes-Repair existing tile only No-Repair and maintain tile

Repaired By: _____

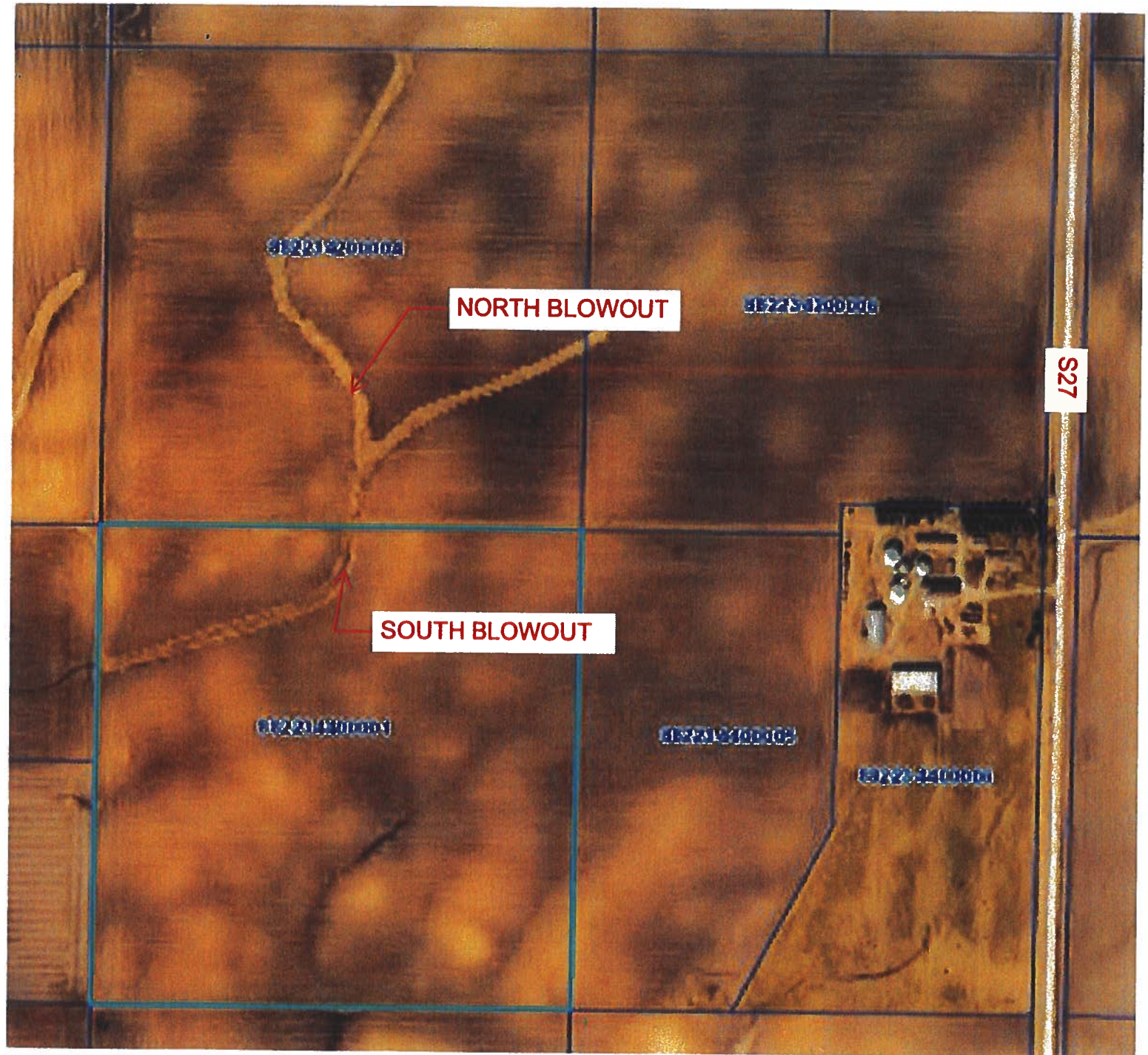
Date: _____

Please send statement for services to:
 Hardin County Auditor's Office
 Attn: Tina Schlemme
 1215 Edgington Ave, Suite 1
 Eldora, IA 50627
 Phone (641) 939-8111
 Fax (641) 939-8245

For Office Use Only

Approved: _____ Date: _____





NORTH BLOWOUT

SOUTH BLOWOUT

S27

S122312400002

S122312400016

S122312400001

S122312400002

S122312400003

Drainage District:

#14

Investigation Summary:

- Per the earlier recommendations and authorization, CCTV inspected the 15-inch VCP Main Tile starting at existing 3 feet diameter blowout located in the grass waterway approximately 1900 feet east of County Highway S27 and approximately 2650 feet south of County Highway D41.
- Televised 884.9 feet upstream (to the north) from said existing tile blowout and found 17 locations of partial/imminent collapse. (see attached Tabulated Defects sheet)
- Televised 995 feet downstream (to the south) from said existing tile blowout and found 9 locations of partial/imminent collapse. (see attached Tabulated Defects sheet)
- Temporarily repaired 4 tile locations, 2 north and 2 south (1 was at tenant's request) from the start location of the CCTV with 15" Dual Wall HDPE tile with fabric wrapped joints and backfilled the areas with on-site soil.

Contractor Time and Materials (spent while CGA was on-site):

See attached Tabulated Contractor Time and Materials Tabulated Defects sheet.

Additional Actions Recommended:

It is obvious that the Main tile is in disrepair and needs to be repaired based on the CCTV results and the history of repairs in the area. If nothing is done, the tile's condition will only continue to deteriorate which will result in future blowouts and sinkholes that will impact the drainage capacity of the Main tile. Therefore, we would recommend doing at least 6 spot repairs which would consist of replacing approximately 570 feet of existing tile. It is our opinion that the total construction cost would be \$35,000-\$45,000. This cost is low enough that neither a hearing nor Engineer's Report would be required. Alternatively, the District Trustees could pursue replacement of the Main tile for its entire length of CCTV, the cost of which would exceed \$50,000 and require a hearing and Engineer's Report.





Tabulated Contractor Time and Materials

| Date | Totals | 5/14/2020 |
|---------------------------------|--------|-----------|
| Workman (hrs) | 18.75 | 18.75 |
| Mini Excavator (hrs) | 6.25 | 6.25 |
| UTV with camera Equipment (hrs) | 6.25 | 6.25 |
| 18" Dual Wall HDPE Tile (ft.) | 19.9 | 19.9 |
| CCTV inspection (ft.) | 1878.3 | 1878.3 |





Tabulated Defects

| | Total | GPS #177 UPSTREAM | GPS #178 DOWNSTREAM |
|--|--------|----------------------|------------------------|
| Total Length Televised (ft) | 1879.9 | 884.9 | 995 |
| Date: | | 5/14/2020 | 5/14/2020 |
| Top crack (ft) | 805.3 | 338.5 | 466.8 |
| Side crack (ft) | 161.4 | 69.2 | 92.2 |
| Bottom crack (ft) | 805.3 | 338.5 | 466.8 |
| Partial or imminent collapse (#) | 26 | 17 | 9 |
| Full collapse (#) | 0 | 0 | 0 |
| Debris (ft) | 3 | 3 | 0 |
| Offset Joint (#) | 6 | 5 | 1 |
| Soil/voids visible in offset joint (#) | 5 | 4 | 1 |
| Single Wall HDPE (non-deformed) (ft) | 6.2 | 1.5 | 4.7 |
| Dual Wall HDPE (ft) | 0 | 0 | 0 |
| CMP (rusty) (ft) | 49.8 | 34.3 | 15.5 |
| Holes (non-fixed) (#) | 0 | 0 | 0 |
| Holes (fixed) (#) | 0 | 0 | 0 |
| Alligator Cracks (ft) | 261.4 | 0 | 261.4 |
| Radial Cracks (# of tile) | 2 | 0 | 2 |



CONSTRUCTION ENGINEERING
OBSERVATION REPORT

DATE:

05/14/2020

PROJECT NUMBER: HARDIN DD WO# 6844.4 / DD14

DAYS OF WEEK:

| | | | | | |
|---|---|---|---|----------|---|
| S | M | T | W | F | S |
|---|---|---|---|----------|---|

COUNTY, ROUTE, ROAD: WEST OF CO HWY 527 BETWEEN CO HWY 041 & 220.34 ST

SHEET NO.

1 OF 6

LOCATION: DD#14 MAIN LOCATED SWNE & NWSE 34-88-22 HARDIN COUNTY. INVESTIGATE & TEMPORARILY REPAIR 3 TILE BLOWOUTS

MID 50'S TO UPPER 60'S CLOUDY WITH LIGHT WIND MIST AND FOG IN MORNING & RAIN IN LATE AFTERNOON
JOB# 6844 DD 14. SURVEY

DESCRIPTION OF WORK AND MATERIAL USED FOR EACH OPERATION, INCLUDING CONTRACTOR/SUB NAME, ITEM NO. AND LOCATION

8:30 A.M. LEE CALLED THAT PAUL WOULD BE WORKING ON TELEVISIONING TILE UPSTREAM AND DOWNSTREAM FROM 2 BLOWOUTS 121.4'± TO 160.7'± SOUTH OF GRASS LAWE EAST TO ACREAGE @ 21547 CO HWY 527 IN GRASS WATERWAY & 1 BLOWOUT 445'± NORTH OF GRASS LAWE EAST TO ACREAGE @ 21547 CO HWY 527 IN GRASS WATERWAY AND MAKE TEMPORARY REPAIRS UNTIL DISTRICT DECIDES ON HOW MUCH OF TILE TO REPAIR. OBSERVER LOOKED FOR FILE AND UPLOADED IT TO DATA COLLECTOR.

9:45 A.M. LEE TEXT THAT PAULS CREW WAS JUST LEAVING SHOP AND OBSERVER LEFT FOR JOB SITE TOO.

10:25 A.M. OBSERVER ARRIVED ON SITE AND STARTED SETTING GPS BASE ON GPS# 23 3/4" Ø IRON ROD FLUSH IN SW CORNER FIELD DRIVE IN SE QUADRANT OF CO HWY 041 & CO HWY 527.

10:30 A.M. OBSERVER COULD SEE THAT CREW HAD EQUIPMENT UNLOADED AND WERE DRIVING OUT TO REPAIR LOCATION.

10:50 A.M. OBSERVER CHECKED INTO GPS# 21 SURVEY MARK FLUSH IN ACR CO HWY 527 1/2 MILE SOUTH OF CO HWY 041 WITH BOTH HORIZONTAL AND VERTICAL POSITION CHECKING GOOD.

10:55 A.M. OBSERVER ARRIVED AT JOB SITE. PAUL, DOUG, & WILLIAM WAS ON SITE FOR CREW WITH BOBCAT E85 MINI EXCAVATOR AND UTV WITH TELEVISIONING EQUIPMENT IN BACK. CREW HAD TILE EXPOSED IN HOLE #15. 3.0' Ø BLOWOUT IN GRASS WATERWAY (120'± SOUTH GRASS LAWE EAST TO ACREAGE) AND WAS GETTING SETUP TO TELEVISE UPSTREAM FROM 15" CLAY TILE GPS# 177. TILE HAD ABOUT 5" FLOW

11:05 A.M. CREW STARTED TELEVISIONING UPSTREAM FROM GPS# 177 IN HOLE #15

I Certify that the work described in this report was incorporated into this contract unless otherwise noted.

Observer's Signature: Dean Penning Date Prepared: 05/14/2020

Reviewed by: [Signature] Engineer Date Reviewed: _____

CONSTRUCTION ENGINEERING
OBSERVATION REPORT

DATE:

05/14/2020

PROJECT NUMBER: HARDIN DD WOFF
6844.4/0014
COUNTY, ROUTE, ROAD: WEST OF CO HWY 527 BETWEEN
CO HWY 041 & 220 THST
LOCATION: DD14 MANHOLE TILE LOCATED SWNE & NWSE
34-88-22 HARDIN COUNTY
INVESTIGATE & TEMPORARILY REPAIR 3 TILE BLOWOUTS

DAYS OF WEEK:

S M T W T F S

SHEET NO.

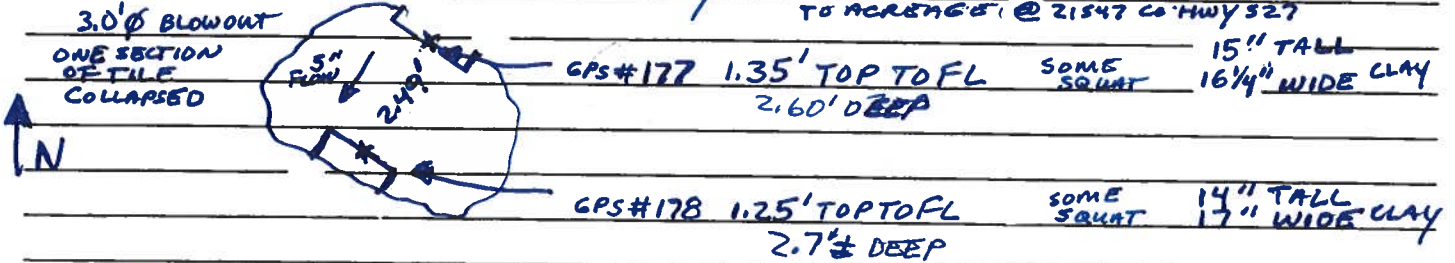
2 OF 6

MID 50'S TO UPPER 60'S CLOUDY WITH LIGHT
WIND MIST & FOG IN MORNING & RAIN
IN LATE AFTERNOON

JOB # 6844 0014 SURVEY

DESCRIPTION OF WORK AND MATERIAL USED FOR EACH OPERATION, INCLUDING CONTRACTOR/SUB
NAME, ITEM NO. AND LOCATION

BLOWOUT #15 IN GRASS WATERWAY 120.3'± SOUTH OF E GRASS LANE EAST
TO ACRE 65 @ 21547 CO HWY 527



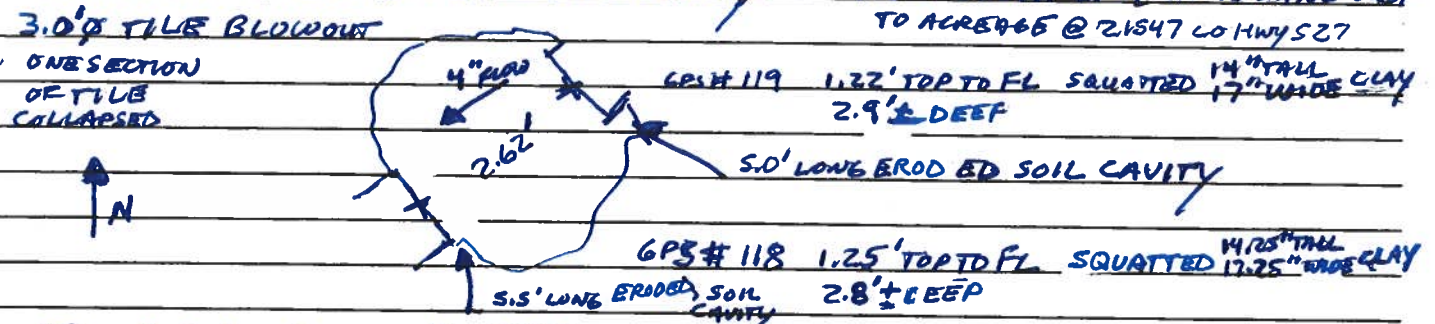
11:25 A.M. CREW STARTED EXCAVATE AT BLOWOUT #2S

11:25 A.M. PICTURE # 3538, 11:28 A.M. PICTURE # 3539, 11:32 A.M.

PICTURE # 3540 SEE PICTURES FOR DETAILS

11:42 A.M. PICTURE # 3541, 11:43 A.M. PICTURE # 3544, 11:48 A.M. PICTURE
3543 & PICTURE # 3544

BLOWOUT #2S IN GRASS WATERWAY 159.9'± SOUTH OF E GRASS LANE EAST
TO ACRE 65 @ 21547 CO HWY 527



12:07 P.M. PICTURE # 3545 & PICTURE # 3546 SEE PICTURE FOR
DETAILS.

12:10 P.M. CREW RAN INTO A SECTION OF TILE THAT HAD COMPLETELY
COLLAPSED.

12:15 P.M. CREW HEADED UP TO BLOWOUT 2N TO EXCAVATE
& EXPOSE TILE SO CREW COULD LOCATE TILE FURTHER NORTH,

I Certify that the work described in this report was incorporated into this contract unless otherwise noted.

Observer's Signature: Dean Penning

Date Prepared: 05/14/2020

Reviewed by: Engineer

Date Reviewed

CONSTRUCTION ENGINEERING
OBSERVATION REPORT

DATE:

05/14/2020

DAYS OF WEEK:

S M T W T F S

PROJECT NUMBER: HARDIN DD W0#
6844.4/0014

COUNTY, ROUTE, ROAD: WEST OF CO HWY 927 BETWEEN
CON WY DMI 8220 THST

LOCATION: DD14 MAIN TILE LOCATED SWNB & NWSE
34-88-22 HARDIN COUNTY
INVESTIGATE & TEMPORARILY REPAIR 3 TILE BLOWOUTS

SHEET NO.

3 OF 6

MID 50'S TO UPPER 60'S CLOUDY WITH LIGHT
WIND MIST & FOG IN MORNING & RAIN
IN LATE AFTERNOON

JOB # 6844 DD14 SURVEY

DESCRIPTION OF WORK AND MATERIAL USED FOR EACH OPERATION, INCLUDING CONTRACTOR/SUB
NAME, ITEM NO. AND LOCATION

12:25 P.M. CREW HAD TILE BLOWOUT #2N EXPOSED AND SECTION OF
CLAY TILE REMOVED. CREW RELIZED COLLAPSED TILE WAS
NOT TILE BLOWOUT #2N.

12:29 P.M. PICTURE #3547 SEE PICTURE FOR DETAILS.

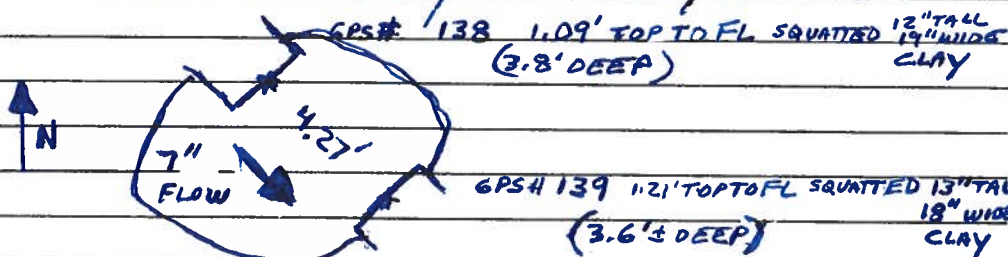
12:30 P.M. CREW LOCATED TILE FROM GPS#177 NORTH TILE INSIDE
TILE BLOWOUT #18 UPSTREAM 537.2' WHERE SECTION OF TILE COLLAPSED
(GPS 128-131, 133 TO 137)

12:43 P.M. PICTURE #3548 SEE PICTURE FOR DETAILS.

12:58 P.M. CREW WAS DONE LOCATING TILE AND STARTED TO EXCAVATE
@ 537.1' WHERE SECTION OF TILE COLLAPSED.

BLOWOUT #2N IN GRASS WATER WAY 443.5' NORTH OF GRASS WATER
WAY TO ACREAGE

5.0' Ø TILE BLOWOUT
2 SECTIONS OF TILE
COLLAPSED



1:09 P.M. PICTURE #3549 & 1:10 P.M. PICTURE #3550 SEE PICTURE FOR DETAILS

1:12 P.M. PICTURE #3551 & PICTURE #3552 SEE PICTURE FOR DETAILS.

1:16 P.M. PICTURE #3553 SEE PICTURE FOR DETAILS.

1:25 P.M. CREW LET WATER FLOW FOR A WHILE & CONTINUED TO TELEVIEW
UPSTREAM PAST 537.1' TILE COLLAPSE UNTIL CAMERA FOUND A
BROKEN CLAY TILE CHUNK IN FLOWLINE AND COULD NOT
GET PAST THE CHUNK @ 883.28' GPS #145.

1:42 P.M. CREW WAS LOCATING TILE.

1:57 P.M. CREW WAS DONE LOCATING TILE AND PULLING CAMERA BACK.

I Certify that the work described in this report was incorporated into this contract unless otherwise noted.

Observer's Signature: Dean Penning

Date Prepared: 05/14/2020

Reviewed by:

Engineer

Date Reviewed

CONSTRUCTION ENGINEERING
OBSERVATION REPORT

DATE:

05/14/2020

PROJECT NUMBER: HARDIN DD WOFF
6844.4/0014
COUNTY, ROUTE, ROAD: WEST OF COUNTY 927 BETWEEN
CO HWY 041 & 220 TH ST
LOCATION: DD14 MANHOLE TILE LOCATED SWNE & NWSE
34-88-22 HARDIN COUNTY
INVESTIGATE & TEMPORARILY REPAIR 3 TILE BLOWOUTS

DAYS OF WEEK:

S M T W T F S

SHEET NO.

4 OF 6

MID 50'S TO UPPER 60'S CLOUDY WITH LIGHT
WIND MIST & FOG IN MORNING & RAIN
IN LATE AFTERNOON

JOB # 6844.0014 SURVEY

DESCRIPTION OF WORK AND MATERIAL USED FOR EACH OPERATION, INCLUDING CONTRACTOR/SUB
NAME, ITEM NO. AND LOCATION

BLOWOUT # 1N IN GRASS WATERWAY 407.2'± NORTH OF GRASS WATERWAY
TO ACREAGE
1 SECTION OF TILE
COLLAPSED
GPS # 147 1.05' TOP TO FL 12" TALL
3.4'± DEEP 19" WIDE CLAY
SQUATED
4.0' LONG
ERODED
SOIL CAVITY
ON WEST SIDE
2 1/2" FLOW
N 1/4
GPS # 146 1.32' TOP TO FL 15" TALL
(3.3'± DEEP) 17" WIDE CLAY

2:05 P.M. PICTURE # 3557 SEE PICTURE FOR DETAILS

2:14 P.M. PICTURE # 3558 & PICTURE # 3559 SEE PICTURE FOR DETAILS.

CREW WILL REMOVE NEXT CLAY TILE SECTION TO NORTH IN
TILE BLOWOUT # 1N DUE TO CONDITION.

2:33 P.M. PICTURE # 3560 SEE PICTURE FOR DETAILS.

BLOWOUT # 1N IN GRASS WATERWAY 407.2'± NORTH OF GRASS WATERWAY
TO ACREAGE

TEMPORARY REPAIR TILL
DISTRICT DECIDES ON REPAIR
2.0' X 4.5' ENGINEERING
FABRIC OVER JOINT
6.3 LF 15" Ø DUAL WALL
NONPERF HOPE TILE
2.0' X 4.5' ENGINEERING FABRIC OVER JOINT
GPS # 152 1.34' TOP TO FL 15.25" TALL
2 1/2" FLOW 3.3'± DEEP 16" WIDE CLAY
GPS 146 1.32' TOP TO FL 15" TALL
3.3'± DEEP 17" WIDE CLAY

2:42 P.M. CREW STARTED TELEVISIONING DOWNSTREAM FROM GPS # 178 IN TILE BLOWOUT # 1S.

CREW WILL REMOVE A CLAY TILE SECTION TO NORTH AND SOUTH IN
TILE BLOWOUT # 2N DUE TO CONDITION.

3:11 P.M. PICTURE # 3562, 3:14 P.M. PICTURE # 3563, 3:19 P.M. PICTURE # 3564 SEE
PICTURE FOR DETAILS.

BLOWOUT # 2N IN GRASS WATERWAY 443.5'± NORTH OF GRASS WATERWAY TO ACREAGE
ENDED UP REMOVING 4 SECTIONS OF TILE
FOR TEMPORARY REPAIR TILL
DISTRICT DECIDES ON REPAIR
GPS # 176 1.39' TOP TO FL (8.5'± DEEP)
2.0' X 4.5' ENGINEERING FABRIC OVER JOINT
8.5 LF OF 15" Ø DW HOPE NONPERF TILE
2.0' X 4.5' ENGINEERING FABRIC OVER JOINT
GPS # 175 1.39' TOP TO FL CLAY 3.6'± DEEP

I Certify that the work described in this report was incorporated into this contract unless otherwise noted.

Observer's Signature: Dean Penning

Date Prepared: 05/14/2020

Reviewed by: _____ Engineer

Date Reviewed _____

CONSTRUCTION ENGINEERING
OBSERVATION REPORT

DATE:

05/14/2020

PROJECT NUMBER:

HARDIN DD W0#

6844.4/0014

COUNTY, ROUTE, ROAD:

WEST OF CO HWY 527 BETWEEN
CO HWY D41 & 220TH ST

LOCATION:

0041 MAIN TILE LOCATED SWNE & NWSE

34-88-22 HARDIN COUNTY

INVESTIGATE & TEMPORARILY REPAIR 3 TILE BLOWOUTS

DAYS OF WEEK:

S M T W **D** F S

SHEET NO.

.5 OF 6

MID 50'S TO UPPER 60'S CLOUDY WITH LIGHT
WIND MIST & FOG IN MORNING & RAIN
IN LATE AFTERNOON

JOB# 6844 0014 SURVEY

DESCRIPTION OF WORK AND MATERIAL USED FOR EACH OPERATION, INCLUDING CONTRACTOR/SUB
NAME, ITEM NO. AND LOCATION

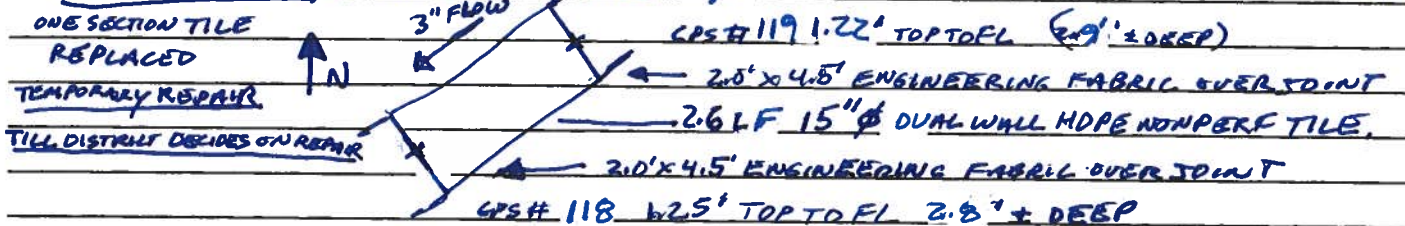
3:33 P.M. PICTURE # 3565 SEE PICTURE FOR DETAILS.

3:35 P.M. CREW WAS DONE BACK FILLING: TILE BLOWOUT #1N & #2N
AND FINISHED TELE VISING 995' DOWNSTREAM TO END OF
CAMERA CABLE. CREW STARTED TO LOCATE TILE.

3:50 P.M. CREW WAS DONE LOCATING TILE AND STARTED
TO RETRIEVE CAMERA.

4:14 P.M. PICTURE # 3566 & PICTURE # 3567 SEE PICTURE FOR DETAILS.

BLOW OUT # 2S IN GRASS WATERWAY 159.9'± SOUTH OF GRASS LANE EAST TO ACRES.



4:19 P.M. PICTURE # 3568 & 4:21 P.M. PICTURE # 3569 SEE PICTURE FOR DETAILS.

BLOWOUT # 1S 120.3'± SOUTH OF
& GRASS LANE
EAST TO ACRES GPS# 177 1.35' TOP TO FL (2.60'± DEEP)



4:29 P.M. PICTURE # 3570 SEE PICTURE FOR DETAILS.

4:45 P.M. CREW LEFT SITE AFTER FINISHING BACK FILLING HOLES.

4:51 P.M. PICTURE # 3571 & 4:52 P.M. PICTURE # 3572. SEE PICTURE FOR DETAILS.

5:00 P.M. OBSERVER TORE DOWN GPS AND LEFT SITE.

SEE QUANTITIES ON SHEET 6

I Certify that the work described in this report was incorporated into this contract unless otherwise noted.

Observer's Signature:

Dean Penning

Date Prepared:

05/14/2020

Reviewed by:

Engineer

Date Reviewed

CONSTRUCTION ENGINEERING
OBSERVATION REPORT

DATE:

05/14/2020

PROJECT NUMBER:

HARDIN DD W0#

DAYS OF WEEK:

S M T W **T** F S

COUNTY, ROUTE, ROAD:

6844.4/0014
WEST OF CO HWY 527 BETWEEN
CO HWY 041 & 220 EAST

SHEET NO.

6 OF 6

LOCATION:

0041 MAIN TILE LOCATED SWNE & NWSE
34-88-22 HARDIN COUNTY

MID 50'S TO UPPER 60'S CLOUDY WITH LIGHT
WIND MIST & FOG 'IN MORNING & RAIN
IN LATE AFTERNOON

INVESTIGATE & TEMPORARILY REPAIR 3 TILE BLOWOUTS

JOB# 6844 0014 SURVEY

DESCRIPTION OF WORK AND MATERIAL USED FOR EACH OPERATION, INCLUDING CONTRACTOR/SUB
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QUANTITIES

PAUL 6 1/4 HOURS

DOUG 6 1/4 HOURS

WILLIAM 6 1/4 HOURS

BOBCAT E85 MINI EXCAVATOR 6 1/4 HOURS

UTV WITH CAMERA EQUIPMENT 6 1/4 HOURS

TELEVISED UPSTREAM FROM GPS# 177 883.3 LF

DOWNSTREAM FROM GPS# 178 995.0 LF.

TEMPORARY REPAIR TILE BLOWOUT IN 6.3 LF 15" Ø DW HDPE NONPERF TILE

UNTIL DISTRICT DECIDES 2- 2.0' x 4.5' ENGINEERING FABRIC
ON HOW MUCH TO REPAIR PIECES

TILE BLOWOUT 2N 8.5 LF 15" Ø DW HDPE NONPERF TILE

2- 2.0' x 4.5' ENGINEERING FABRIC
PIECES

TILE BLOWOUT 1S 2.5 LF 15" Ø DW HDPE NONPERF TILE

2- 2.0' x 4.5' ENGINEERING FABRIC
PIECES

NOTE #1 GPS# 145 REMOVE CLAY

TILE PIECE IN FLOWLINE

② ONCE REPAIR DECIDED
FIX TEMPORARY REPAIRS

TILE BLOWOUT 2S 2.6 LF 15" Ø DW HDPE NONPERF TILE

2- 2.0' x 4.5' ENGINEERING FABRIC
PIECES

NOTE: TILE BLOWOUT IN, 2N, & 2S NEED SEEDED

TILE BLOWOUT 1S NEEDS ADDITIONAL SOIL IN 6.0' x 6.0' x 1.0' x
DEEP AREA THEN SEED.

TILE 1 HAS NUMEROUS BAD SPOTS TO NORTH AND SOUTH OF BLOWOUT 1S.

I Certify that the work described in this report was incorporated into this contract unless otherwise noted.

Observer's Signature:

Dream Perry

Date Prepared:

05/14/2020

Reviewed by:

Engineer

Date Reviewed

COUNTY TILE TELEVISION REPORT

DATE 05 / 14 / 2020

JOB # 6844.4

DD 14 MAIN

UPSTREAM

883.3'

START GPS # 177

END GPS # 145

0.0 CAMERA TIRES IN TILE WITH CAMERA HEAD ABOUT 1.0' +/- INSIDE TILE

FOOTAGE

| | | |
|------|---|---|
| 0.00 | GPS # 177 | 15" CLAY TILE UPSTREAM @ BLOWOUT IS 120.3' BLOWOUT SOUTH OF GRASS LANE EAST TO ACREAGE @ 21547 CO HWY 527. |
| 0.00 | (LC) @ 12 | |
| 0.9 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 11.4 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | (EC) |
| 11.4 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 18.2 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 18.2 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 20.6 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 20.6 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 28.8 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 28.8 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 31.0 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 31.0 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 33.8 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 33.8 | LONGITUDINAL CRACK & CIRCUMFERENTIAL CRACK. | |
| 68.7 | CLAY TO CMP | |

PICTURE # 3538 IS LOOKING SW @ BLOWOUT # 1 IS SHOWING CREW
TELEVISIONING WASSTREAM FROM GPS# 177



GPS# 178
TOP 14" TALL
17" WIDE
CLAY TILE
1.25' TOP TO FL



05/14/2020
11:25

GPS# 177 TOP 15" TALL 16 1/4" WIDE
1.35' TOP TO FL



GPS# 119
TOP 14" TALL
17" WIDE
CLAY TILE
1.25' TOP TO FL

ERODED
SOIL
CAVITY

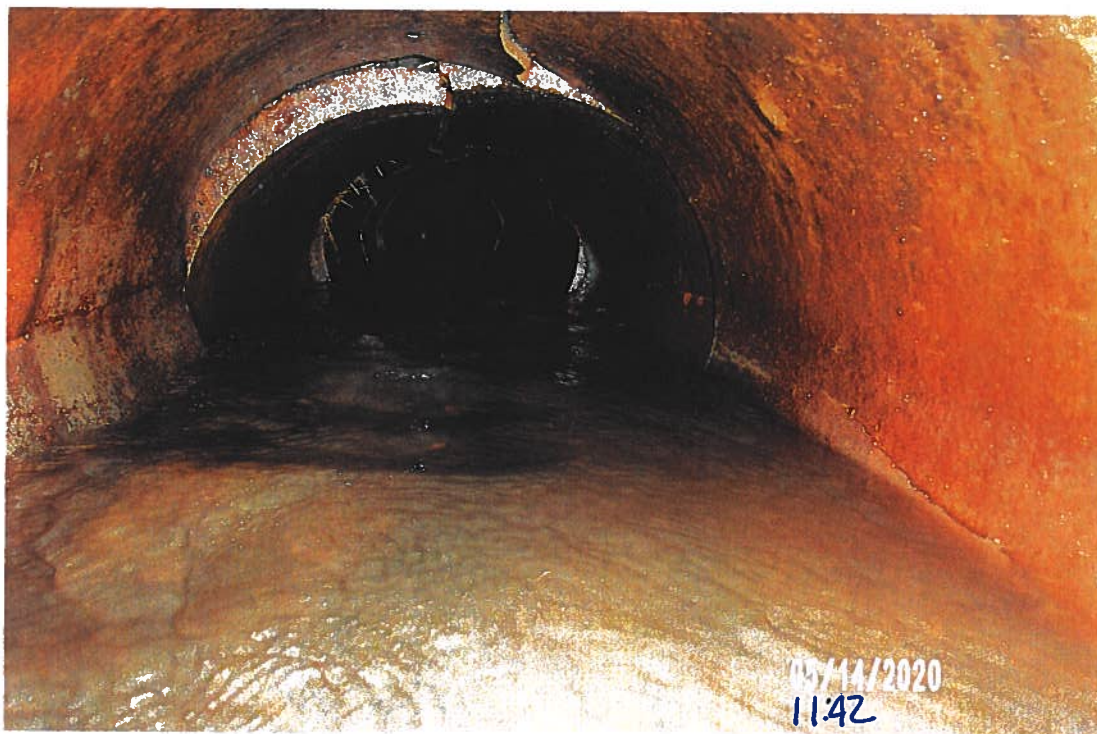
05/14/2020
11:28

11:28

PICTURE # 3539 IS LOOKING NE @ BLOWOUT # 25 SHOWING A 5.0'
LONG CAVITY ON EAST SIDE OF TILE WHERE SOIL ERODED
AWAY

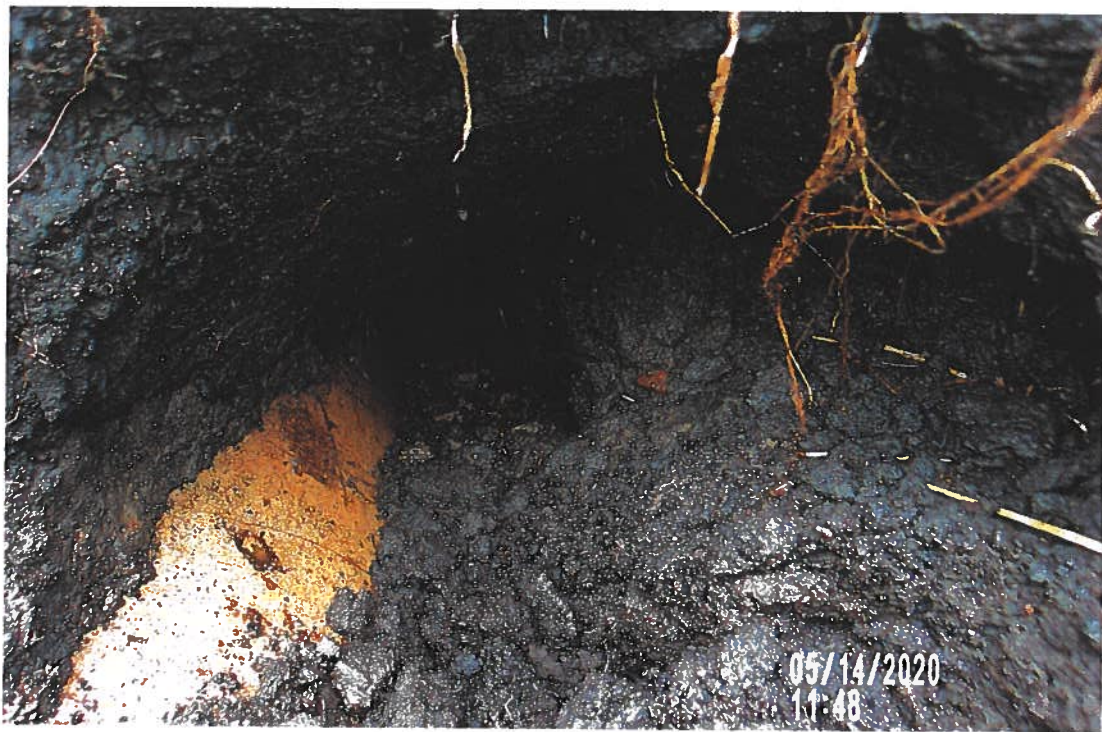
PICTURE #354D IS LOOKING SW IN BLOWOUT #2S SHOWING 5.5' LONG ERODED SOIL CAVITY ON EAST SIDE OF TILE

GPS# 118 TOP 14 1/4" TALL X 17 1/4" WIDE



PICTURE 354I IS LOOKING SW INSIDE CLAY TILE DOWNSTREAM INSIDE BLOWOUT 2S SHOWING NEXT COUPLE SECTIONS IN BAD SHAPE WITH CRACKS AND LEAVING DOWN. FROM GPS# 118

PICTURE # 3542 IS LOOKING NE INSIDE CLAY TILE UPSTREAM INSIDE BLOWOUT 2S SHOWING NEXT COUPLE SECTIONS IN BAD SHAPE WITH CRACKS AND APPEAR TO BE CAVING DOWN, FROM GPS # 119



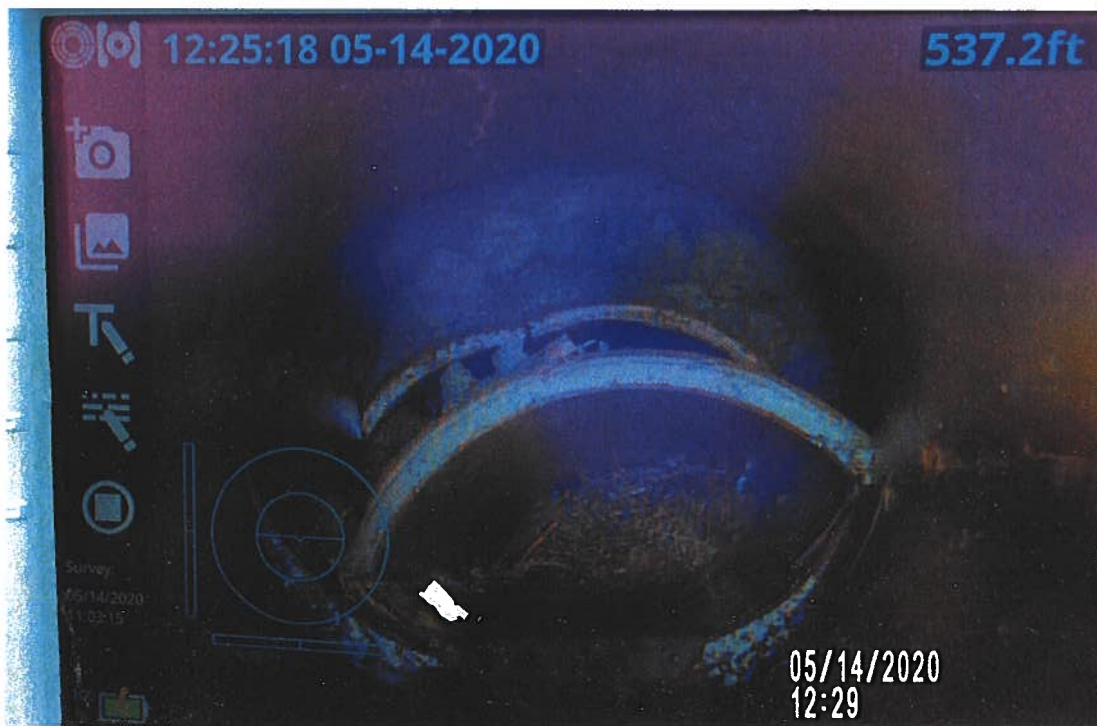
PICTURE # 3543 IS LOOKING NE ON EAST SIDE OF TILE AT 5.0' LONG SOIL ERODED CAVITY IN BLOWOUT # 2S FROM GPS # 119

PICTURE # 3544 IS LOOKING SW ON EAST SIDE OF TILE AT 5.5' LONG
SOIL ERODED CAVITY IN BLOWOUT # 28 FROM GPS # 118



PICTURE # 3545 IS LOOKING NW INSIDE BLOWOUT 2 IN 5.0' ϕ HOLE
WITH CORN STALKS AND SOIL IN BOTTOM.

PICTURE # 3546 IS LOOKING SOUTH AT BLOWOUT 2N (5" HOLE) IN GRASS
WATER WAY BACK TOWARDS GRASSLANE TO ACREAGE



PICTURE # 3547 IS LOOKING UPSTREAM AT COMPLETELY COLLAPSED
SECTION OF CLAY TILE @ 537.2' WHICH HAD NOT SURFACED
YET & SOUTH OF TILE BLOWOUT # 2N,

PICTURE# 3548 IS LOOKING SE AT TILE BLOWOUT #2N TILE EXPOSED WITH 5" FLOW.



GPS# 139
13" TALL
18" WIDE
SQUARED
1.25' TOPTOFL
(3.6' ± DEEP)

GPS# 138
12" TALL
17" WIDE
SQUARED
1.09' TOPTOFL
(3.8' ± DEEP)

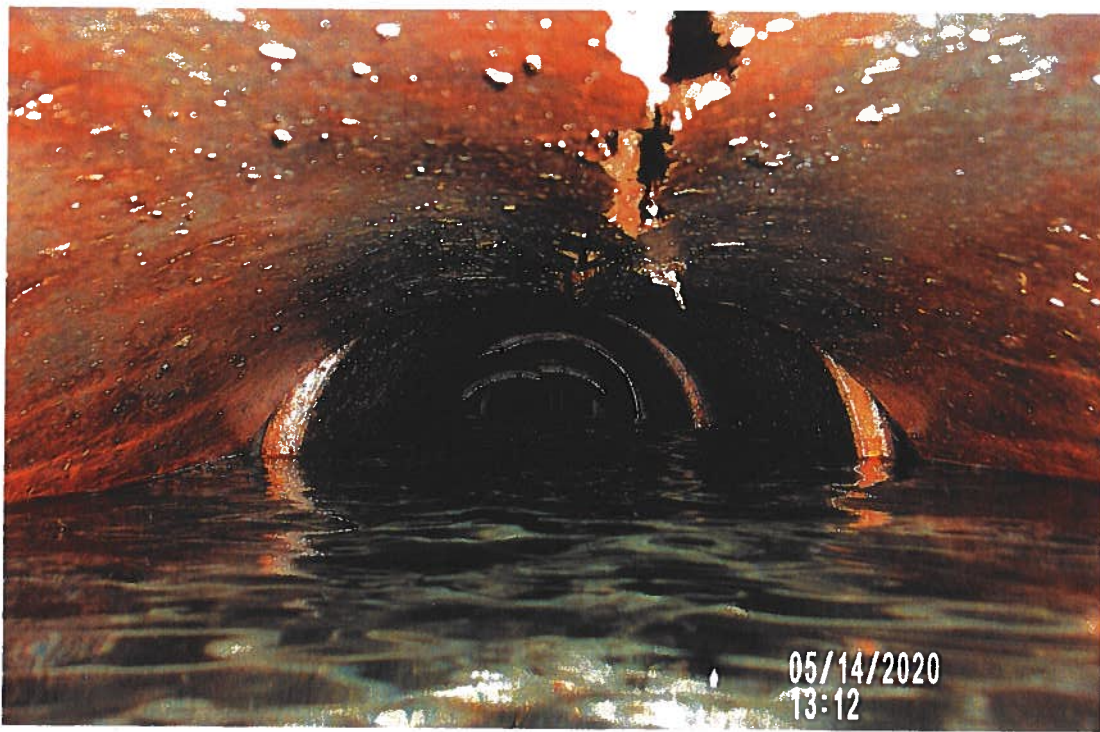
05/14/2020
12:48



05/14/2020
13:09

PICTURE# 3549 IS LOOKING NW SHOWING VOID UNDER GRASS WATERWAY THAT HAD NEVER SURFACED YET. ONLY 1.0' TO 1.5' OF SOIL OVER VOID @ 537.1' WHERE TILE COMPLETELY

PICTURE # 3550 IS LOOKING NW SHOWING VOID UNDER GRASS WATERWAY @ 537.1' WHERE TILE COMPLETELY COLLAPSED.



PICTURE # 3551 IS LOOKING NW SHOWING 1ST SECTION OF TILE WITH SEVERE LONGITUDINAL CRACK AND CAVING DOWN. UPSTREAM FROM GPS# 138 WITH SEVERAL OTHER TILE CRACKED AND CAVING DOWN SEVERAL FEET UPSTREAM.

PICTURE # 3552 IS LOOKING SE SHOWING 1ST SECTION OF CLAY TILE WITH LONGITUDINAL CRACKS AND CAVING DOWN DOWNSTREAM FROM CPS# 139 WITH REST OF SECTIONS OF TILE NOT LOOKING TOO BAD



N
↓



N
↓

CPS# 147
12" TALL
19" WIDE
SQUATTY CLAY
1.05' TOP TO FL:
3.5' ± DEEP

CPS# 146
15" TALL
17" WIDE
CLAY
1.32' TOP TO FL
3.3' ± DEEP

PICTURE # 3553 IS LOOKING NE SHOWING COLLAPSED SECTION OF TILE REMOVED AND NOW FLOWING GOOD IN BLOWOUT. IN

PICTURE# 3557 IS LOOKING NW SHOWING 4.0' LONG ERODED SOIL CAVITY ON WEST SIDE OF TILE IN IN TILE BLOWOUT # IN FROM GPS# 147



PICTURE# 3558 IS LOOKING SE INSIDE CLAY TILE IN TILE BLOWOUT # IN FROM GPS# 146 SHOWING TILE CRACKED BUT NOT GIVING DOWN,

PICTURE #3559 IS LOOKING NW INSIDE CLAY TILE FROM GPS# 147 IN TILE BLOWOUT # IN SHOWING TOP CRACKED AND CAVING DOWN



PICTURE # 3560 IS LOOKING NW INSIDE CLAY TILE FROM GPS # 152 IN TILE BLOWOUT # IN SHOWING TILE CRACKED BUT NOT CAVING DOWN.

PICTURE # 3561 IS LOOKING NW SHOWING TEMPORARY REPAIR OF 6.3 LF OF 15" Ø DUAL WALL NON PERFORATED TILE INSTALLED IN TILE BLOWOUT # 1N WITH BOTH JOINTS WRAPPED WITH FABRIC.



GPS#152
TOP 15.25" TALL
16" WIDE
CLAY
(1.34' TOP TO FL)

GPS#146
TOP 15" TALL
17" WIDE
CLAY
(1.32' TOP TO FL)



PICTURE # 3562 IS LOOKING SE INSIDE CLAY TILE FROM GPS# 175 IN TILE BLOWOUT # 2N SHOWING TILE WITH FINE CRACKS BUT NOT CAVING DOWN

PICTURE #3563 IS LOOKING NW INSIDE CLAY TILE FROM GPS #176
 IN TILE BLOWOUT # 2N SHOWING TILE WITH FINE CRACKS BUT
 NOT CAVING DOWN IN 1ST TWO SECTIONS BUT NEXT TWO SECTIONS
 APPEAR TO BE CAVING DOWN. CREW ENDED UP REMOVING



2 SECTIONS
 OF CLAY
 TILE ON
 NORTH END
 DUE TO NEXT
 SECTION
 COLLAPSING
 DURING
 REMOVAL
 N ↑

05/14/2020
 15:14



GPS#176
 15.75" TALL
 16" WIDE
 CLAY
 (1.36' TOP TO FL)
 ↑ N

GPS#175
 15" TALL
 15.75" WIDE
 CLAY
 (1.36' TOP TO FL)

05/14/2020
 15:19

PICTURE # 3564 IS LOOKING NORTH SHOWING CREW INSTALLED 8.5 LF
 OF 15" Ø DUAL WALL NONPERF TILE IN BLOWOUT # 2N WITH BOTH
 JOINTS WRAPPED WITH FABRIC FOR TEMPORARY REPAIR UNTIL DISTRICT

PICTURE # 3567 IS LOOKING NW SHOWING TILE BLOWOUT #2N
 BACK FILLED AND DRESSED UP IN GRASS WATERWAY BUT
 STILL NEEDS SEEDED



GPS # 119
 14" TALL
 17" WIDE
 SQUARED CLAY
 (1.22' TOP TO FL)

GPS # 118
 14.25" TALL
 17.25" WIDE
 SQUARED CLAY
 (1.25' TOP TO FL)
 (DUAL)

PICTURE # 3568 IS LOOKING NE SHOWING 2.6 LF OF 15" Ø DUAL
 WALL HOPE NONPERF TILE INSTALLED WITH BOTH JOINTS
 WRAPPED WITH FABRIC FOR TEMPORARY REPAIR IN BLOWOUT #2S

PICTURE# 3565 IS LOOKING NE INSIDE CLAY TILE UPSTREAM INSIDE
BLOWOUT# 1S SHOWING TILE CRACKED BUT NOT CAVING DOWN FROM
GPS# 177

↑



↑

PICTURE# 3566 IS LOOKING NW SHOWING TILE BLOWOUT# 1.N
BACK FILLED AND DRESSED UP IN GRASS WATERWAY BUT
STILL NEEDS SEEDED

PICTURE#3569 IS LOOKING SW INSIDE CLAY TILE DOWNSTREAM
INSIDE BLOWOUT#15 SHOWING TILE CRACKED AND CAVING DOWN
SOME FROM GPS# 178



GPS# 177
15" TALL
16.25" WIDE
CLAY
(1.35' TOP TO FL)

GPS# 178 14" TALL 17" WIDE CLAY (1.24' TOP TO FL)

PICTURE# 3570 IS LOOKING NW SHOWING 2.5 LF OF 15" Ø
DUAL WALL HOPE NONPERF TILE WITH BOTH JOINTS WRAPPED WITH FABRIC
FOR TEMPORARY REPAIR IN BLOWOUT # 15.

PICTURE # 3571 IS LOOKING NORTH SHOWING BLOWOUT 2S
BACKFILLED AND DRESSED UP BUT NEEDS SEEDS
YET.



PICTURE # 3572 IS LOOKING NORTH SHOWING BLOWOUT IS
BACKFILLED. HOLE IS STILL SHORT OF SOIL IN 6.0' X 6.0'
& 1.0'± DEEP AREA. NEED TO BACK FILL MORE SOIL AND SEED



WRc MSCC Third Edition

Inspection Report

Produced on behalf of – HARDIN CO

Site location – ,

Survey reference – W/O 290

Date – 140520

WILLIAMS UNDERGROUND SVCS.

102 INDUSTRIAL DRIVVE, ACKLEY, IOWA

50601,

641-485-3925

Contents

| | | |
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| 1.1 | Site information | Error! Bookmark not defined. |
| 1.2 | Drain / Sewer Details | Error! Bookmark not defined. |
| 1.3 | Survey Details | Error! Bookmark not defined. |
| 1.4 | Drain / Sewer Diagram | Error! Bookmark not defined. |
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| 2.1 | Site information | Error! Bookmark not defined. |
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| 2.3 | Survey Details | Error! Bookmark not defined. |
| 2.4 | Drain / Sewer Diagram | Error! Bookmark not defined. |
| 2.5 | Observations | Error! Bookmark not defined. |
| 2.6 | Photographs..... | Error! Bookmark not defined. |

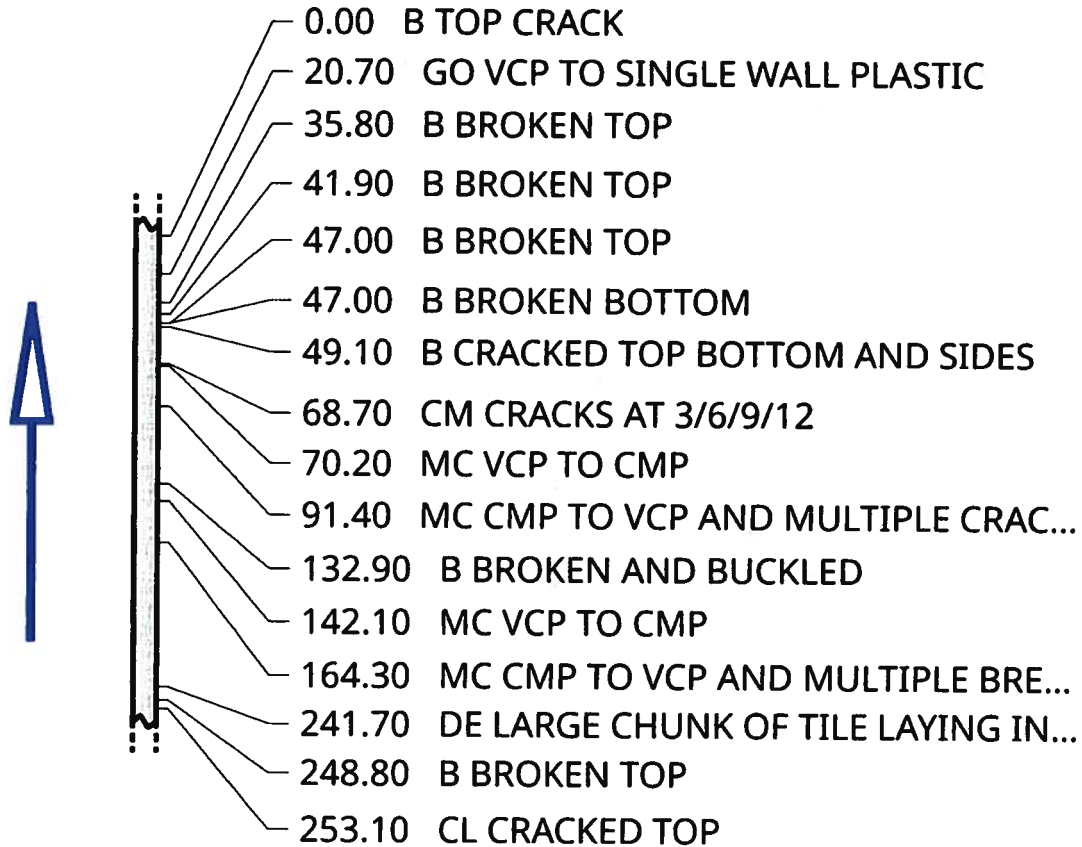
1 Drain / Sewer Survey

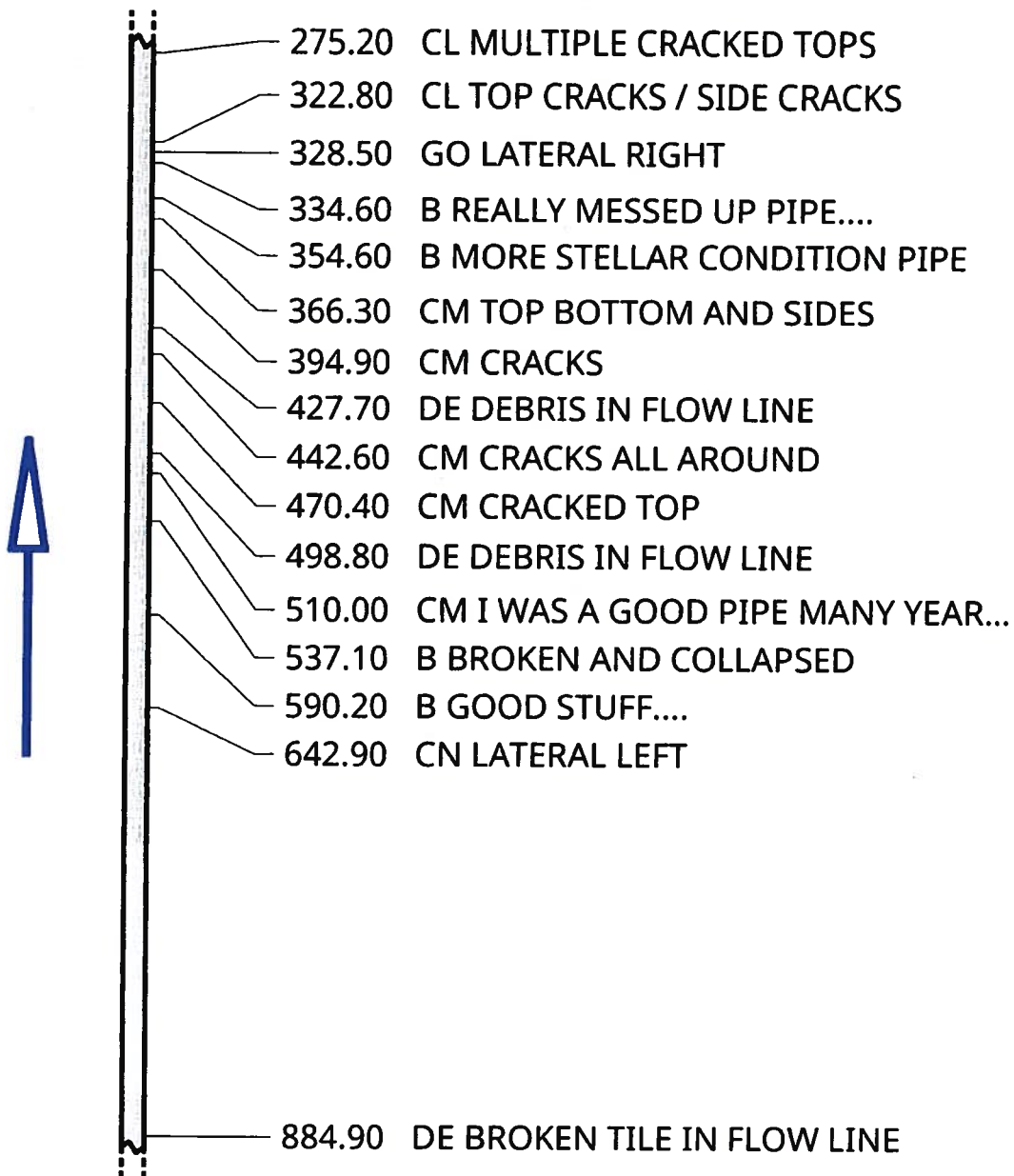
1.1 Survey Header

| | | |
|--------|---------------------------|---------|
| 1.1.1 | Surveyed by (Operator) | PAUL |
| 1.1.2 | Contract no. | |
| 1.1.3 | Job no. | W/O 290 |
| 1.1.4 | Catchment (Drainage area) | DD14 |
| 1.1.5 | Division | |
| 1.1.6 | District | DD14 |
| 1.1.7 | Pipeline length ref | 1000 |
| 1.1.8 | Date | 140520 |
| 1.1.9 | Time | 11:03 |
| 1.1.10 | Location | |
| 1.1.11 | Start manhole no. | |
| 1.1.12 | Start depth | m |
| 1.1.13 | Start cover level | |
| 1.1.14 | Start invert level | |
| 1.1.15 | Finish manhole no. | |
| 1.1.16 | Finish depth | m |
| 1.1.17 | Finish cover level | |
| 1.1.18 | Finish invert level | |
| 1.1.19 | Use of Drain | |
| 1.1.20 | Direction | U |
| 1.1.21 | Size 1 (diameter/height) | 18mm |
| 1.1.22 | Size 2 (width) | mm |
| 1.1.23 | Shape | C |
| 1.1.24 | Material | VC |
| 1.1.25 | Lining | |
| 1.1.26 | Pipe length | m |
| 1.1.27 | Total length | |
| 1.1.28 | Year laid | |
| 1.1.29 | Video cassette number | |
| 1.1.30 | Comments: General | |
| 1.1.31 | Purpose | F |
| 1.1.32 | Sewer category | |
| 1.1.33 | Pre-cleaning | |
| 1.1.34 | Weather | |
| 1.1.35 | Location code | |
| 1.1.36 | Further location details | |











1.2 Diagram










[page 1/2]





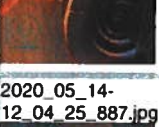
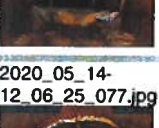
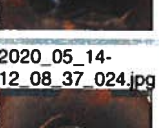
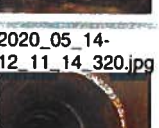
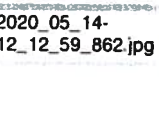









1.3 Observations

| Video Ref | Dist (ft) | Cont Defect | Code | Photo Ref | Diameter/ Dimension | Clock | | Intrusion | | Remarks |
|-----------|-----------|-------------|------|--|------------------------|-------|----|-----------|----|------------------------------|
| | | | | | | At | To | % | mm | |
| 0:00:32 | 0.0 | | B | 2020_05_14-11_06_59_253.jpg  | | 12 | 12 | | | TOP CRACK |
| 0:03:23 | 20.7 | | GO | 2020_05_14-11_10_19_975.jpg  | | | | | | VCP TO SINGLE WALL PLASTIC |
| 0:10:12 | 35.8 | | B | 2020_05_14-11_18_15_064.jpg  | | 11 | 01 | | | BROKEN TOP |
| 0:11:09 | 41.9 | | B | 2020_05_14-11_19_50_872.jpg  | | 12 | 01 | | | BROKEN TOP |
| 0:11:54 | 47.0 | | B | 2020_05_14-11_20_59_932.jpg  | | 12 | 02 | | | BROKEN TOP |
| 0:12:24 | 47.0 | | B | 2020_05_14-11_21_48_750.jpg  | | 06 | 06 | | | BROKEN BOTTOM |
| 0:12:56 | 49.1 | | B | 2020_05_14-11_22_48_871.jpg  | | 12 | 11 | | | CRACKED TOP BOTTOM AND SIDES |
| 0:16:39 | 68.7 | | CM | 2020_05_14-11_27_25_733.jpg  | | 11 | 10 | | | CRACKS AT 3/6/9/12 |
| 0:17:04 | 70.2 | | MC | 2020_05_14-11_28_55_319.jpg  | | | | | | VCP TO CMP |
| 0:19:04 | 91.4 | | MC | 2020_05_14-11_31_33_629.jpg  | | | | | | CMP TO VCP AND MULTIPLE |

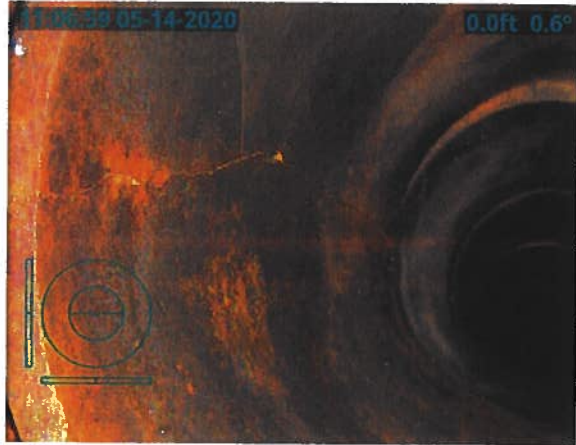
| Video Ref | Dist (ft) | Cont Defect | Code | Photo Ref | Diameter/ Dimension | Clock | | Intrusion | | Remarks |
|-----------|-----------|-------------|------|--|------------------------|-------|----|-----------|----|---|
| | | | | | | At | To | % | mm | |
| | | | |  | | | | | | CRACKS ALL AROUND |
| 0:21:14 | 132.9 | | B | 2020_05_14-11_34_21_116.jpg  | | 12 | 11 | | | BROKEN AND BUCKLED |
| 0:21:48 | 142.1 | | MC | 2020_05_14-11_35_23_408.jpg  | | | | | | VCP TO CMP |
| 0:22:45 | 164.3 | | MC | 2020_05_14-11_36_46_142.jpg  | | | | | | CMP TO VCP AND MULTIPLE BREAKS AT ALL CLOCK POSITIONS |
| 0:27:05 | 241.7 | | DE | 2020_05_14-11_42_18_623.jpg  | | | | 35% | | LARGE CHUNK OF TILE LAYING IN FLOW LINE |
| 0:28:47 | 248.8 | | B | 2020_05_14-11_45_05_840.jpg  | | 12 | 12 | | | BROKEN TOP |
| 0:29:39 | 253.1 | | CL | 2020_05_14-11_46_32_650.jpg  | | 12 | | | | CRACKED TOP |
| 0:31:09 | 275.2 | | CL | 2020_05_14-11_48_36_134.jpg  | | 12 | | | | MULTIPLE CRACKED TOPS |
| 0:33:47 | 322.8 | | CL | 2020_05_14-11_51_44_890.jpg  | | 12 | | | | TOP CRACKS / SIDE CRACKS |
| 0:35:01 | 328.5 | | GO | 2020_05_14-11_53_44_167.jpg | | | | | | LATERAL RIGHT |

| Video Ref | Dist (ft) | Cont Defect | Code | Photo Ref | Diameter/ Dimension | Clock | | Intrusion | | Remarks |
|-----------|-----------|-------------|------|--|------------------------|-------|----|-----------|----|-------------------------------------|
| | | | | | | At | To | % | mm | |
| | | | |  | | | | | | |
| 0:35:36 | 334.6 | | B | 2020_05_14-11_56_23_311.jpg  | | 12 | 11 | | | REALLY MESSED UP PIPE.... |
| 0:36:50 | 354.6 | | B | 2020_05_14-11_58_15_678.jpg  | | 11 | 12 | | | MORE STELLAR CONDITION PIPE |
| 0:37:47 | 366.3 | | CM | 2020_05_14-11_59_48_835.jpg  | | 11 | 12 | | | TOP BOTTOM AND SIDES |
| 0:39:47 | 394.9 | | CM | 2020_05_14-12_02_18_136.jpg  | | 11 | 12 | | | CRACKS |
| 0:41:19 | 427.7 | | DE | 2020_05_14-12_04_25_887.jpg  | | | | 25% | | DEBRIS IN FLOW LINE |
| 0:42:27 | 442.6 | | CM | 2020_05_14-12_06_25_077.jpg  | | 11 | 12 | | | CRACKS ALL AROUND |
| 0:44:01 | 470.4 | | CM | 2020_05_14-12_08_37_024.jpg  | | 12 | 02 | | | CRACKED TOP |
| 0:46:09 | 498.8 | | DE | 2020_05_14-12_11_14_320.jpg  | | | | 25% | | DEBRIS IN FLOW LINE |
| 0:47:23 | 510.0 | | CM | 2020_05_14-12_12_59_862.jpg | | 11 | 12 | | | I WAS A GOOD PIPE MANY YEARS AGO... |

| Video Ref | Dist (ft) | Cont Defect | Code | Photo Ref | Diameter/ Dimension | Clock | | Intrusion | | Remarks |
|-----------|-----------|-------------|------|---|------------------------|-------|----|-----------|----|--------------------------|
| | | | | | | At | To | % | mm | |
| | | | |  | | | | | | |
| 0:50:12 | 537.1 | | B | 2020_05_14-12_16_39_476.jpg  | | 08 | 03 | | | BROKEN AND COLLAPSED |
| 1:19:44 | 590.2 | | B | 2020_05_14-13_24_29_424.jpg  | | 10 | 12 | | | GOOD STUFF.... |
| 1:21:51 | 642.9 | | CN | 2020_05_14-13_27_02_815.jpg  | 4? | 10 | | | | LATERAL LEFT |
| 1:31:25 | 884.9 | | DE | 2020_05_14-13_37_34_943.jpg  | | | | 50% | | BROKEN TILE IN FLOW LINE |

1.4 Photographs

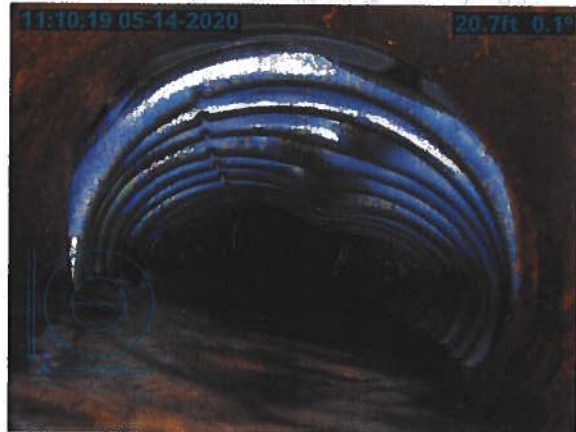
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B 2020_05_14-11_19_50_872.jpg



GO 2020_05_14-11_10_19_975.jpg



B 2020_05_14-11_20_59_932.jpg



B 2020_05_14-11_18_15_064.jpg



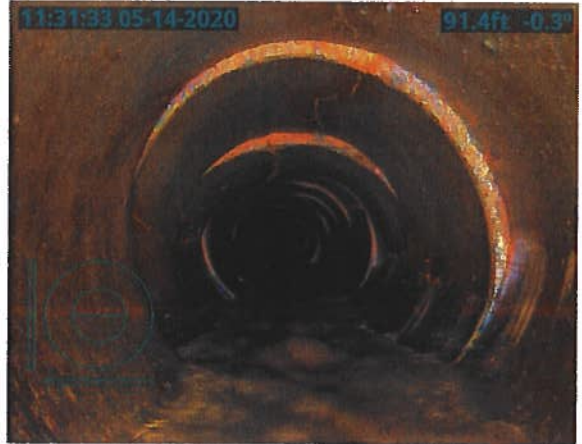
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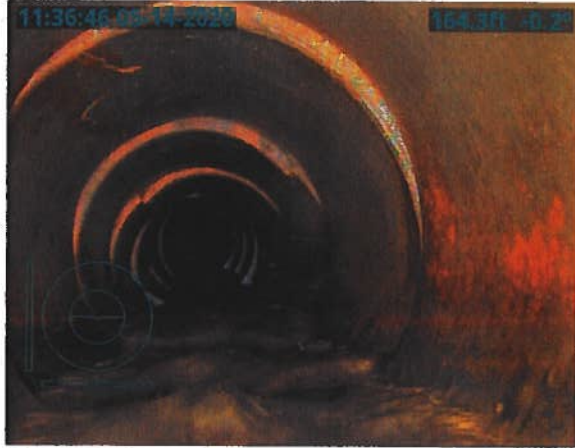
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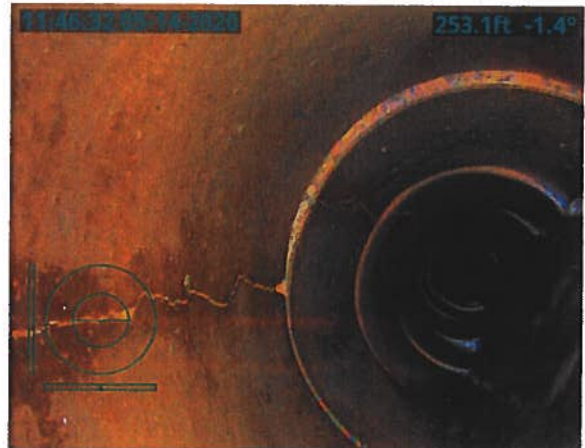
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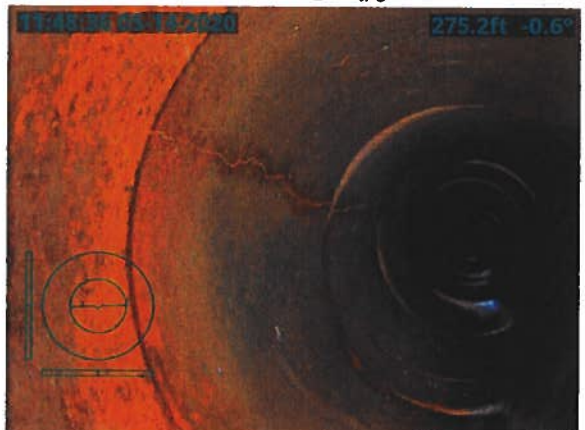
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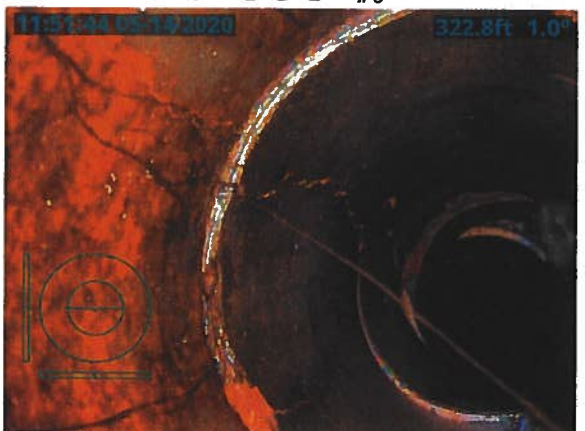
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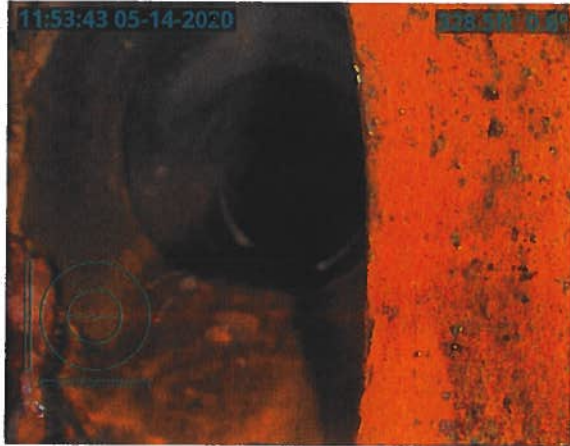
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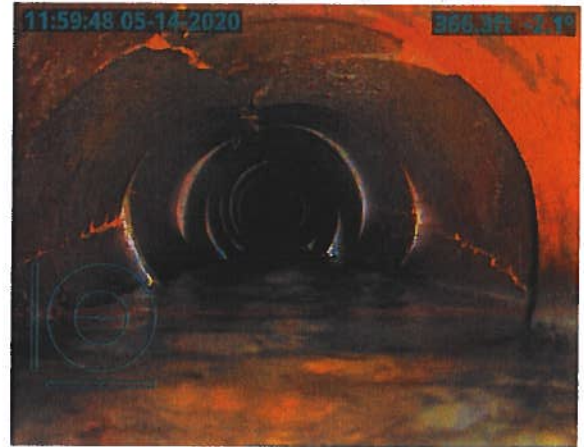
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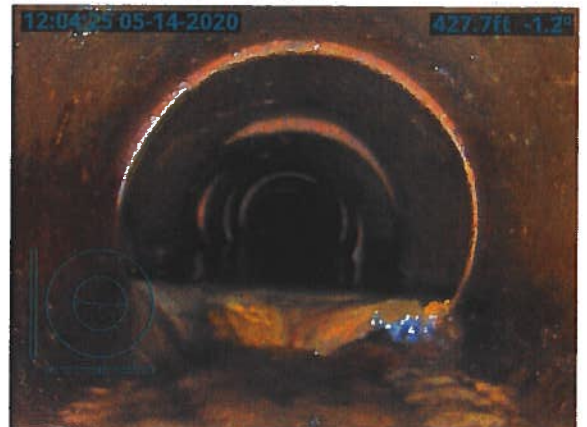
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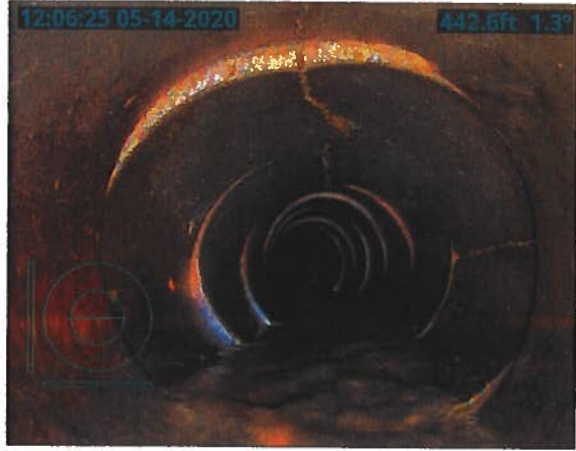
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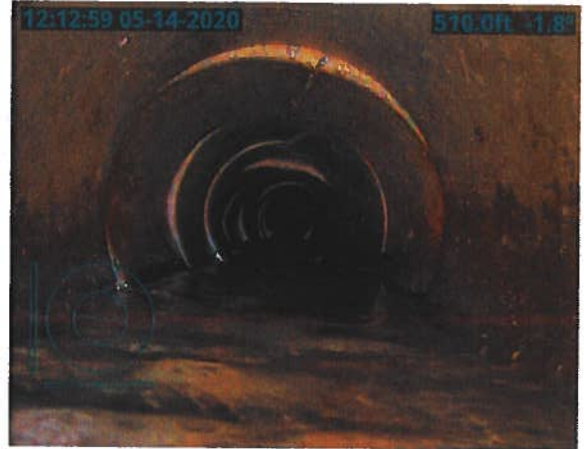
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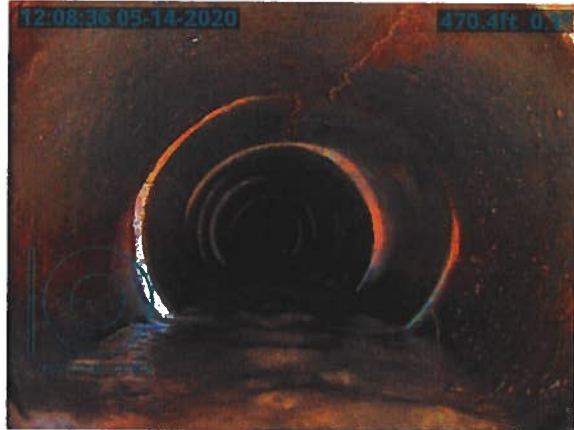
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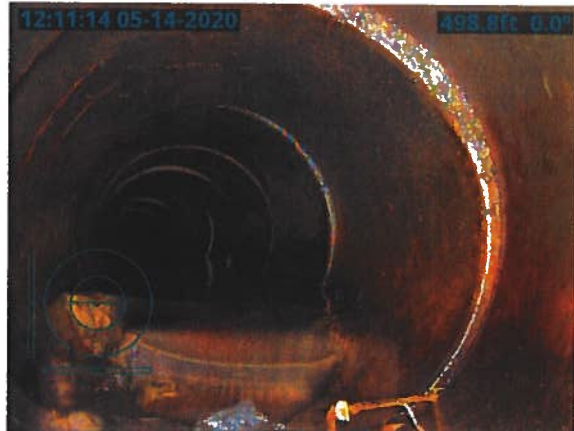
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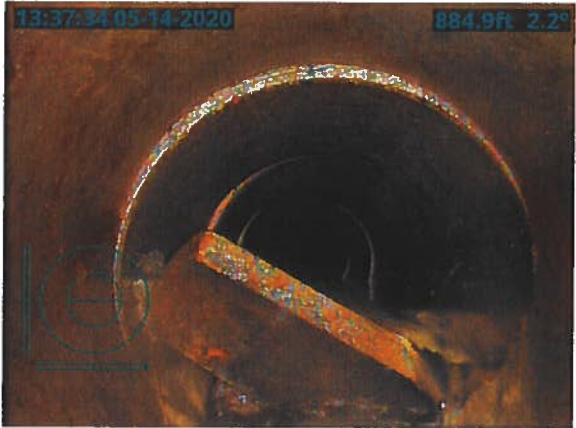
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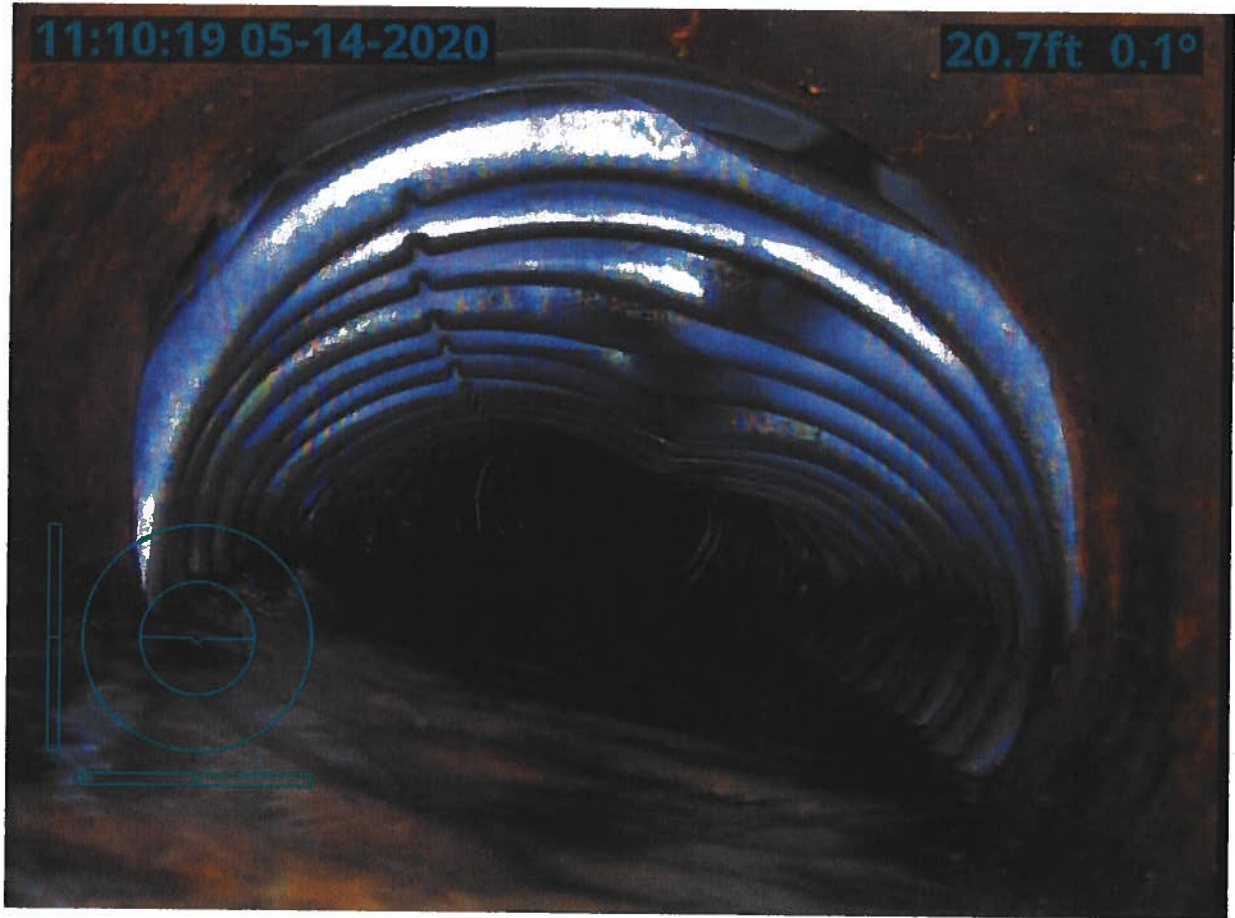
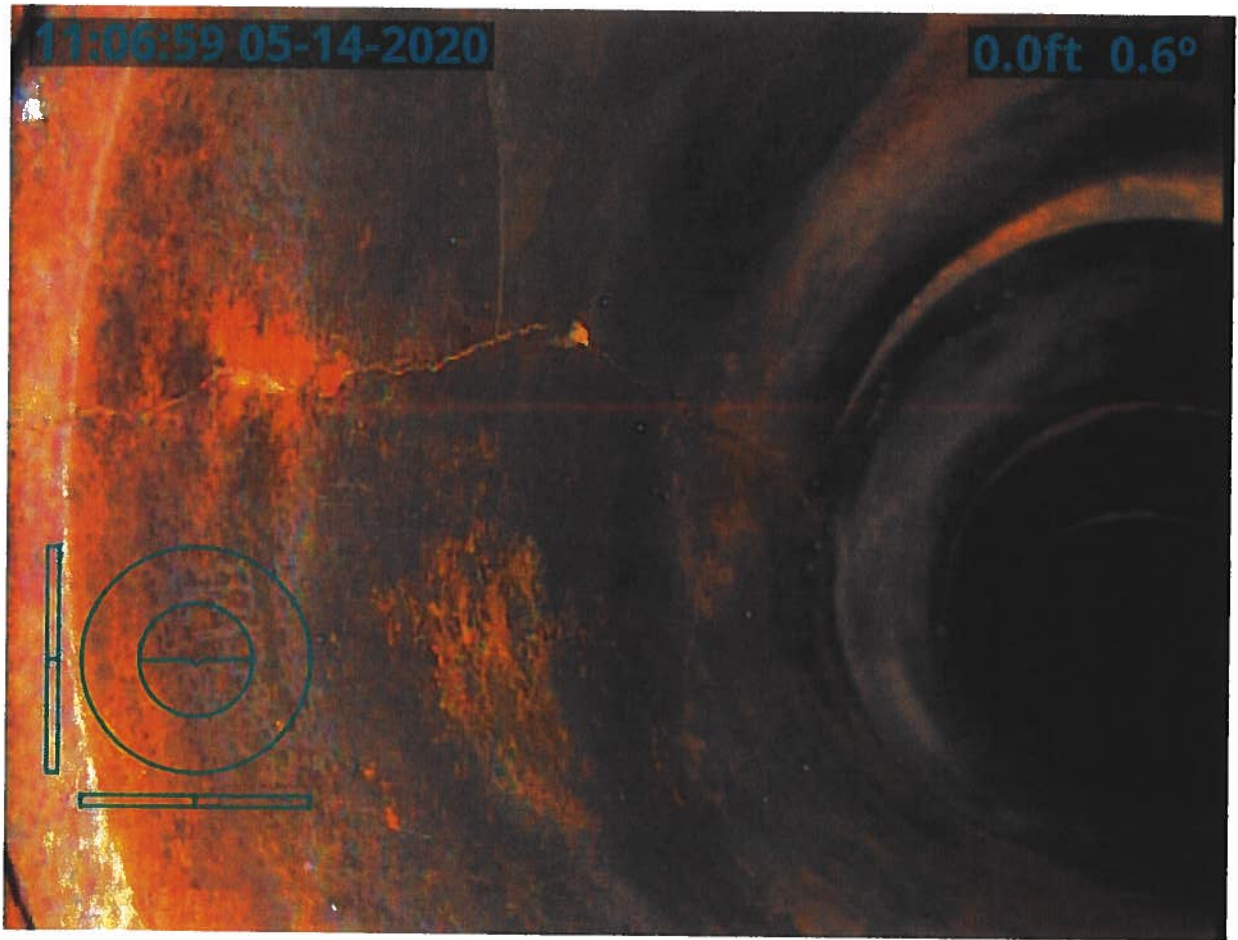


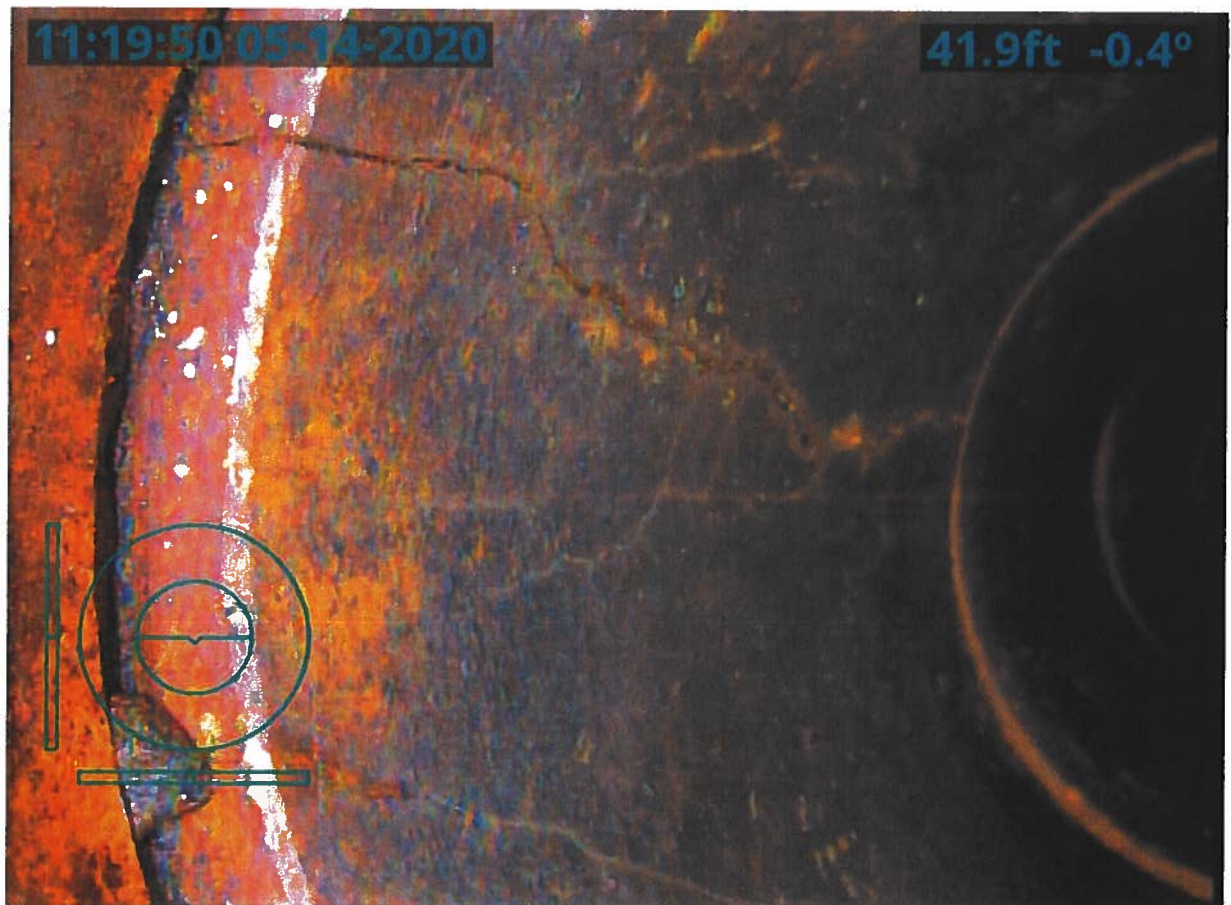
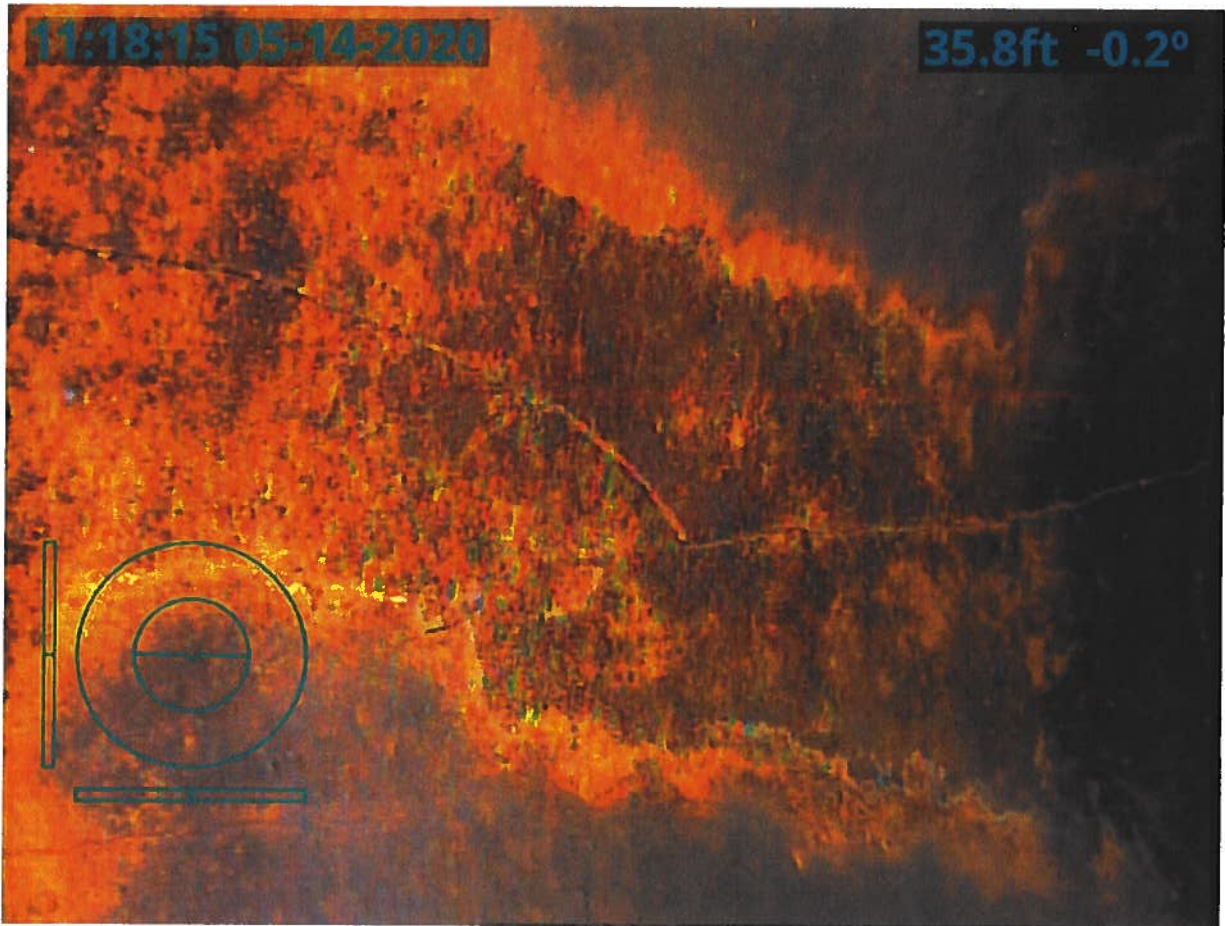
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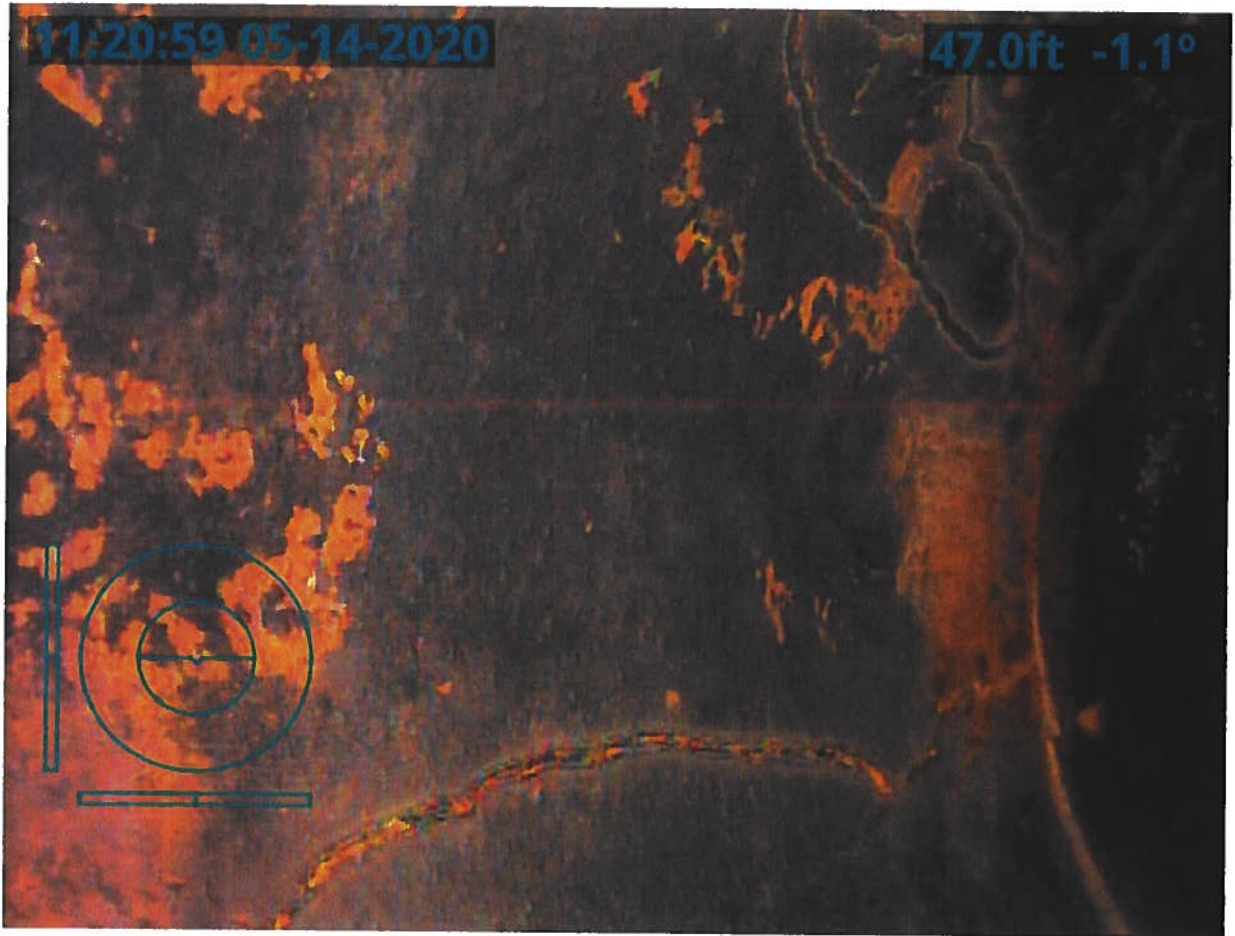






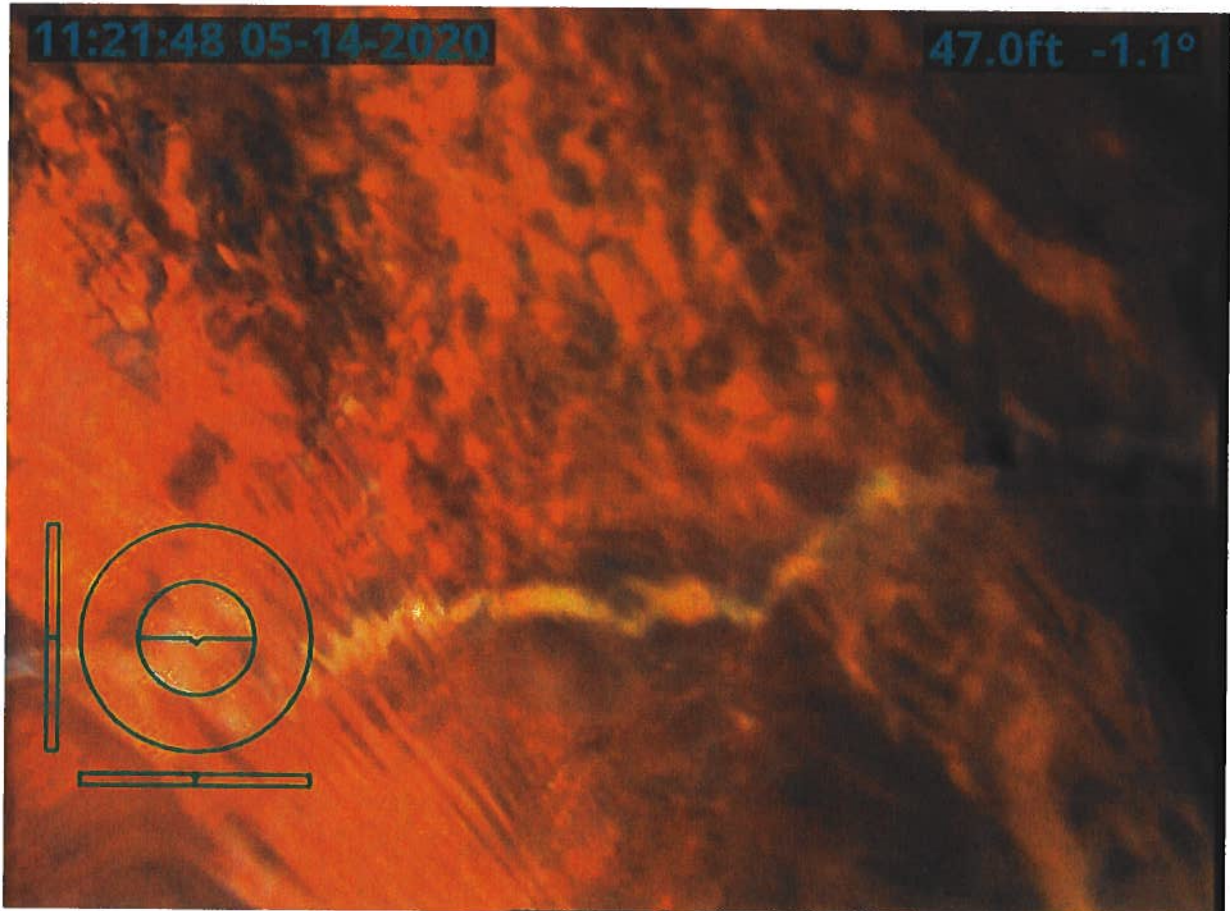
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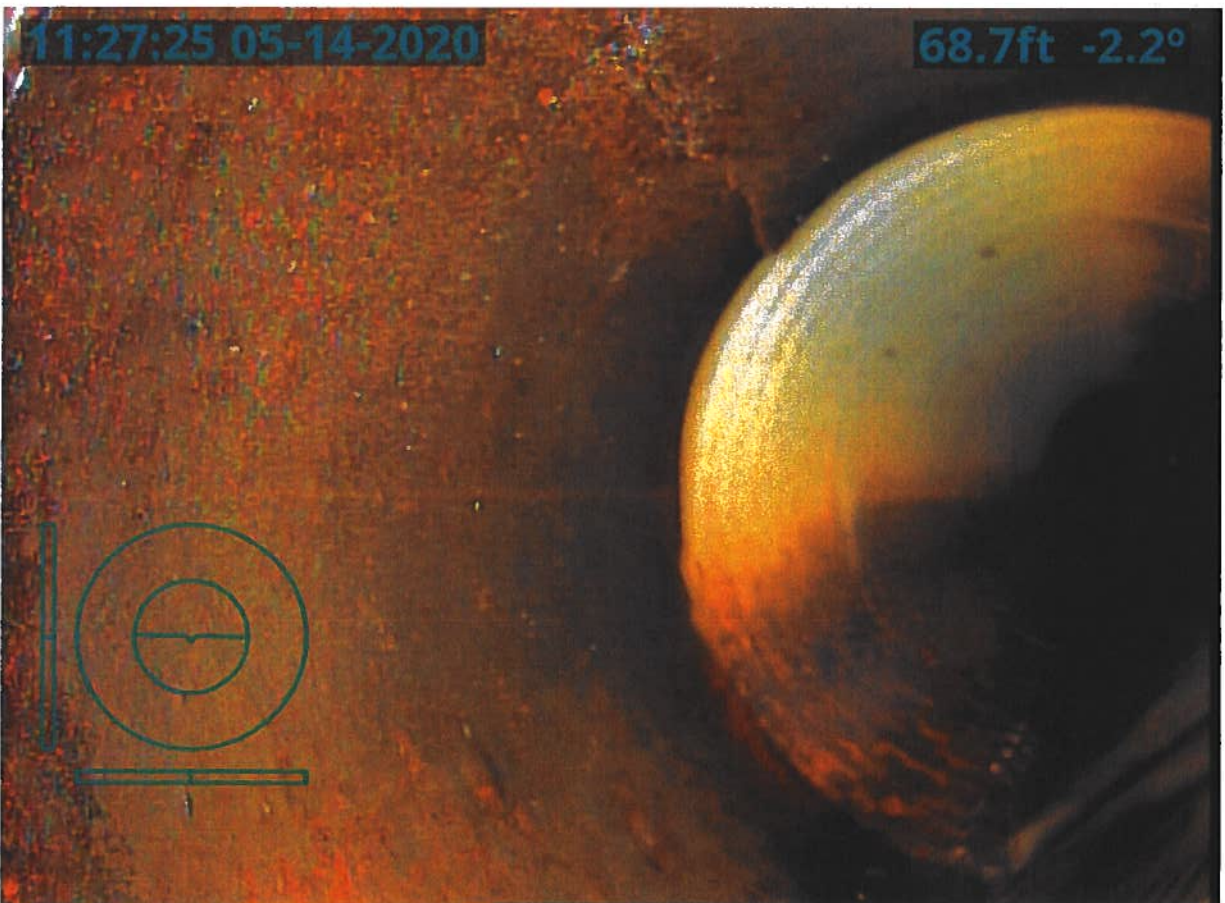
47.0ft -1.1°

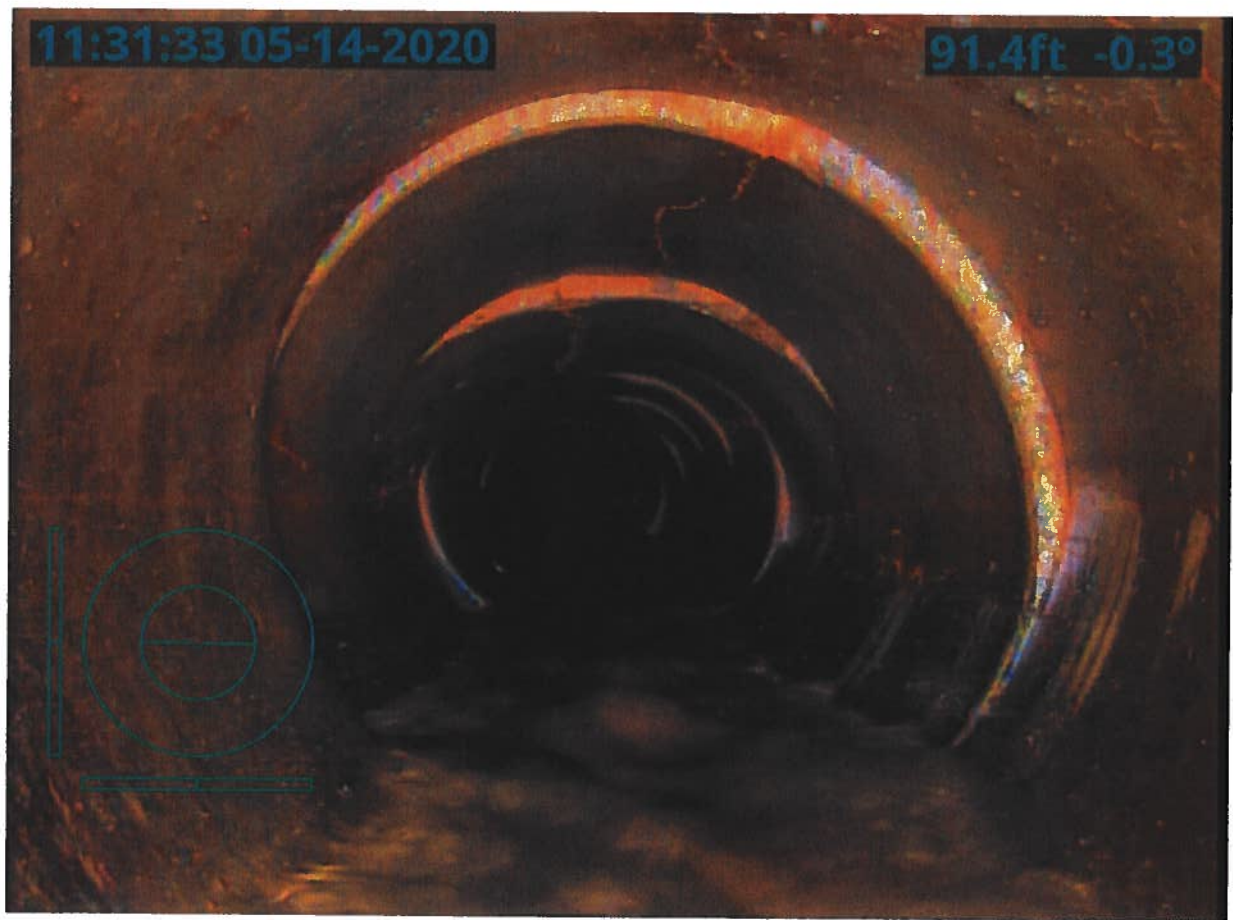
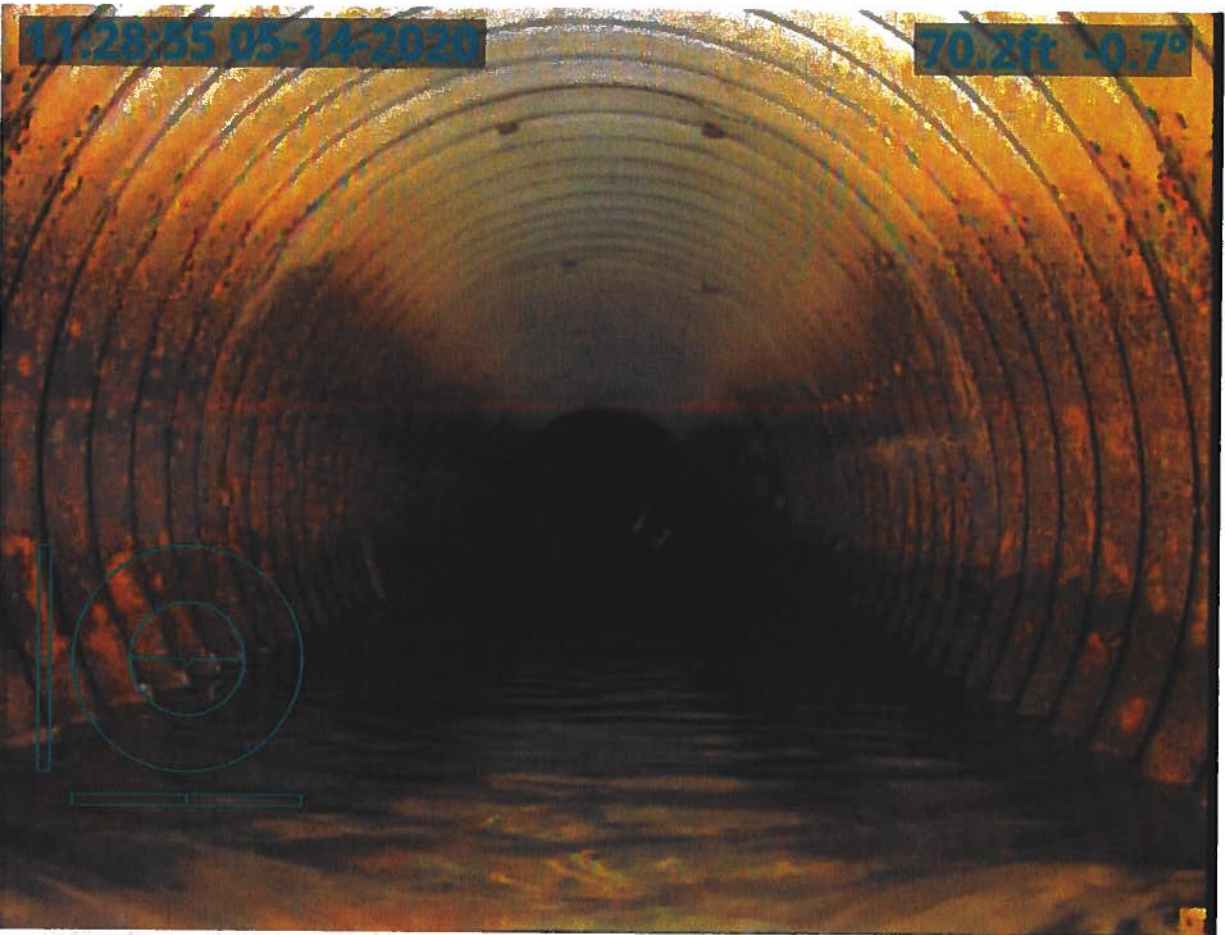


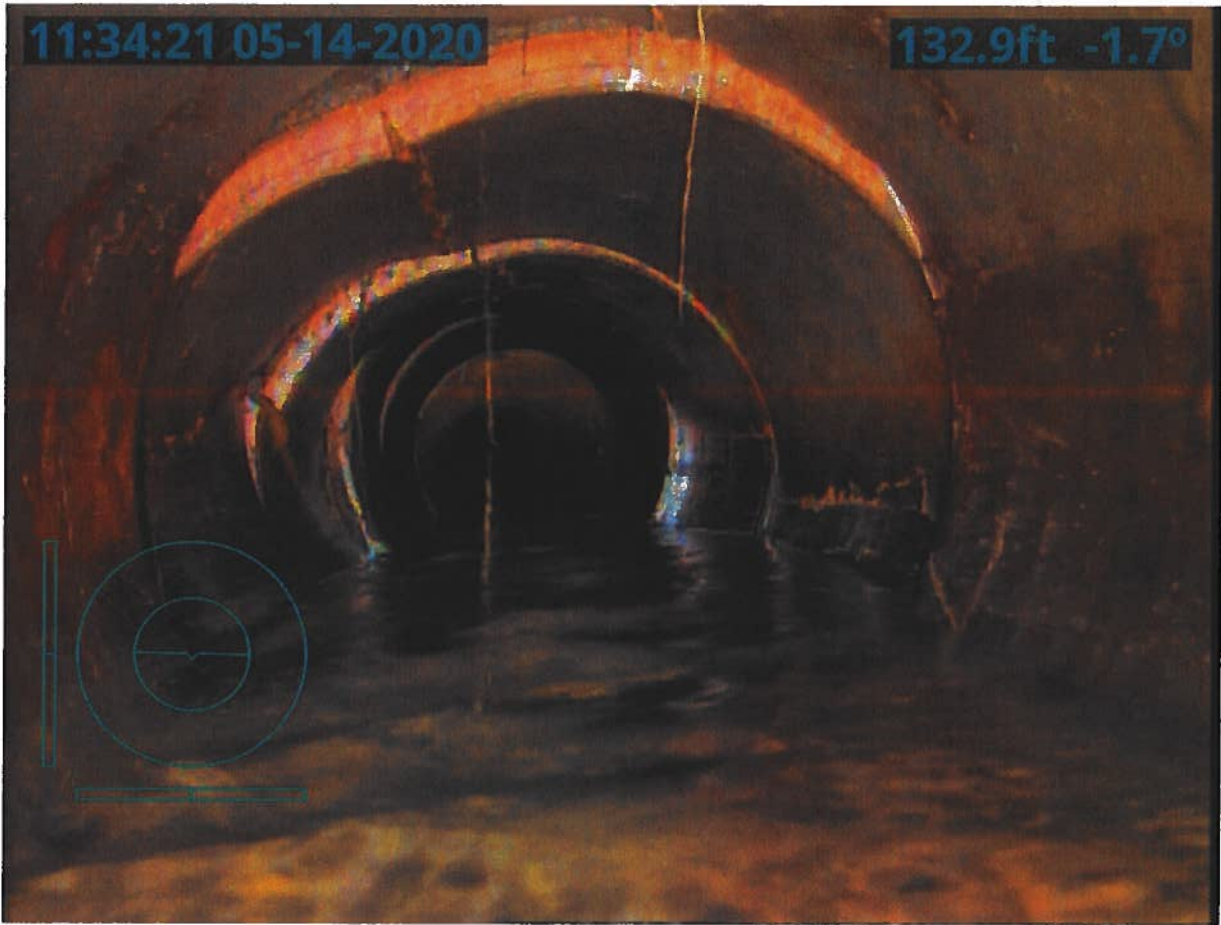
11:21:48 05-14-2020

47.0ft -1.1°



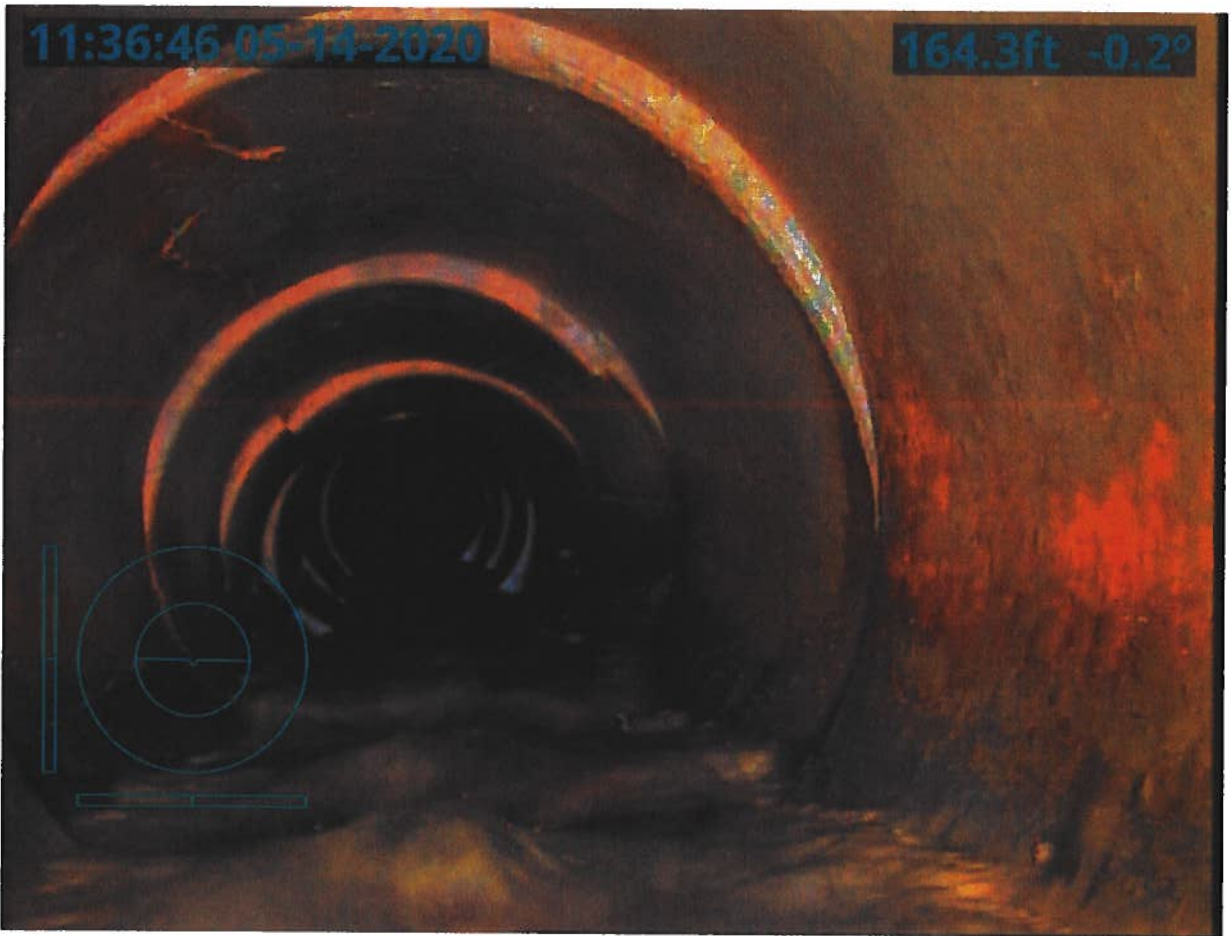






11:36:46 05-14-2020

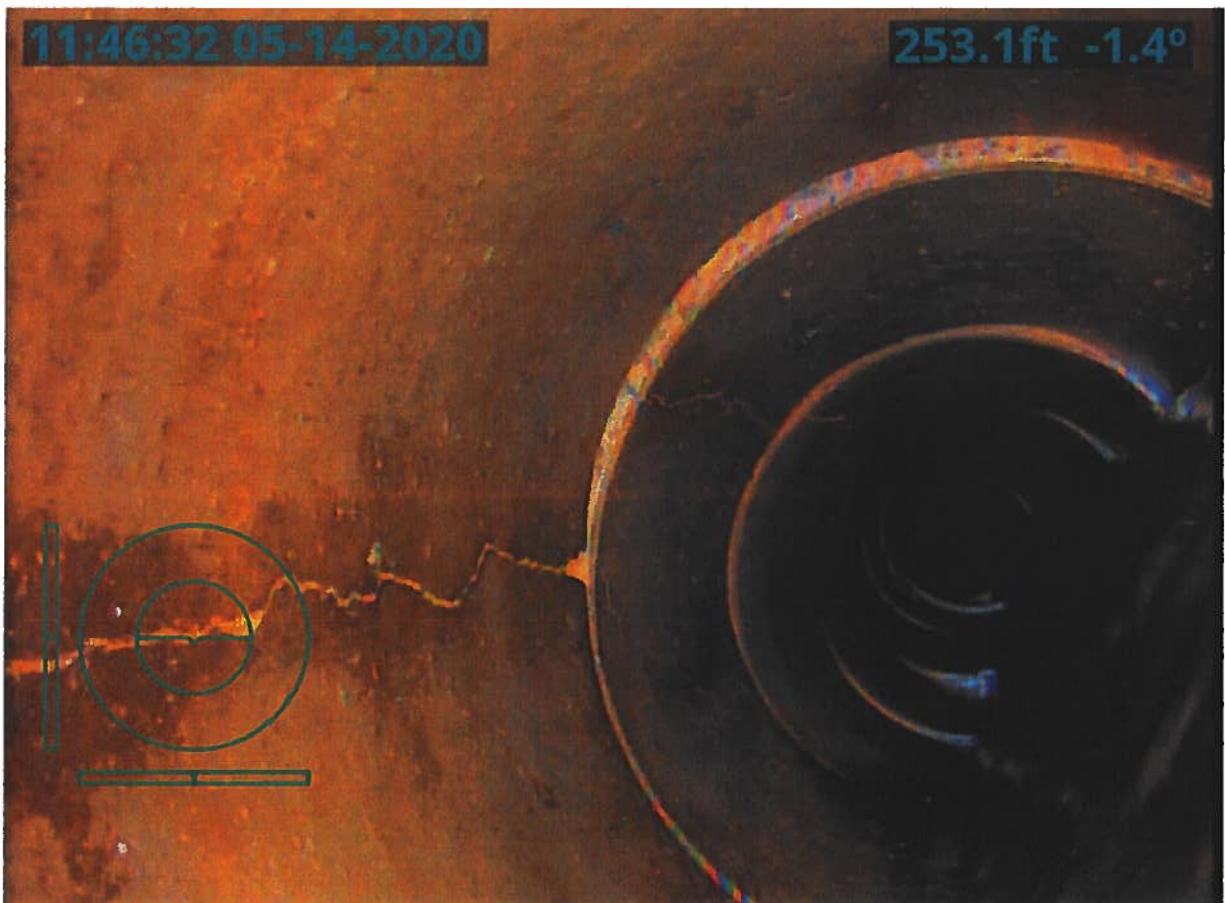
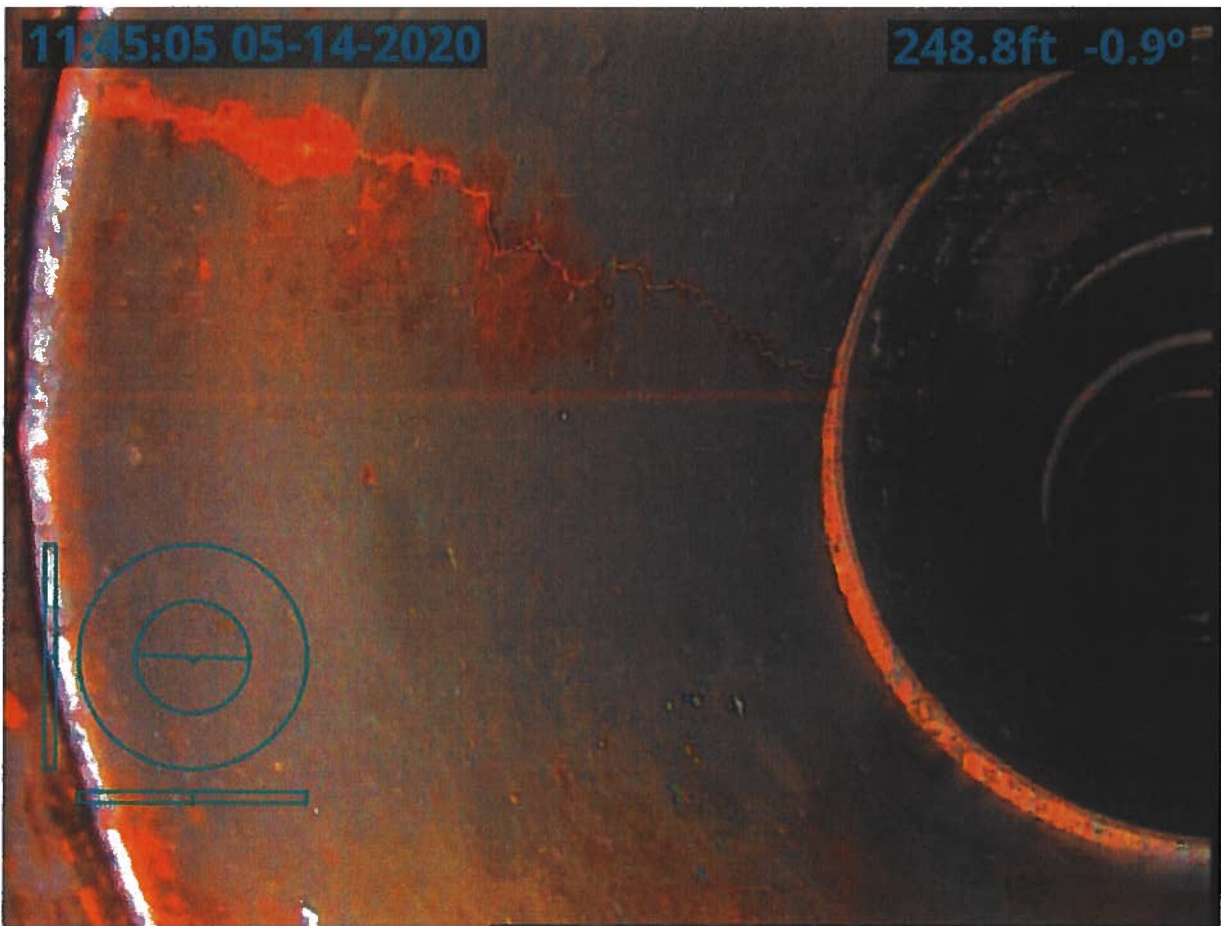
164.3ft -0.2°



11:42:18 05-14-2020

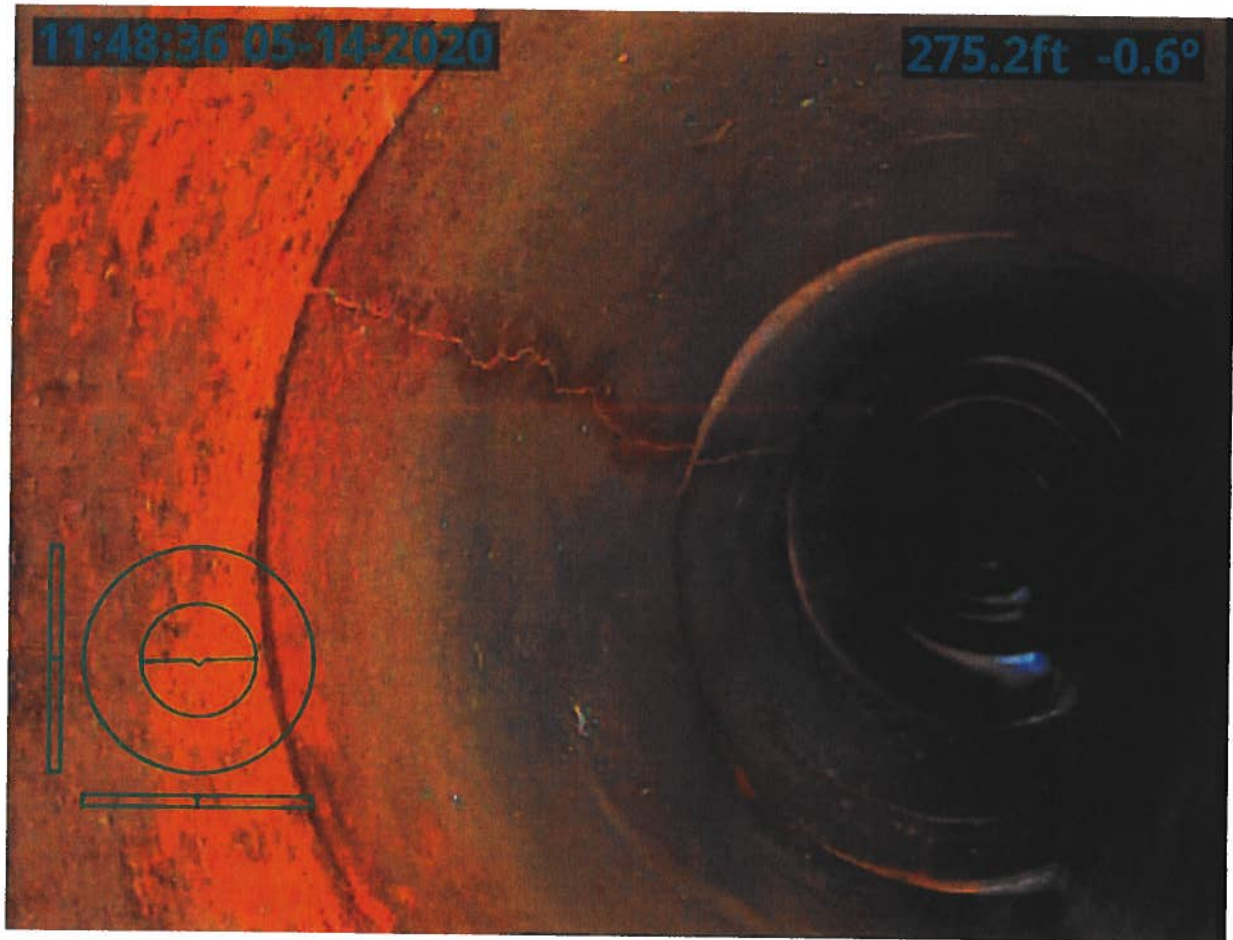
241.7ft 0.5°





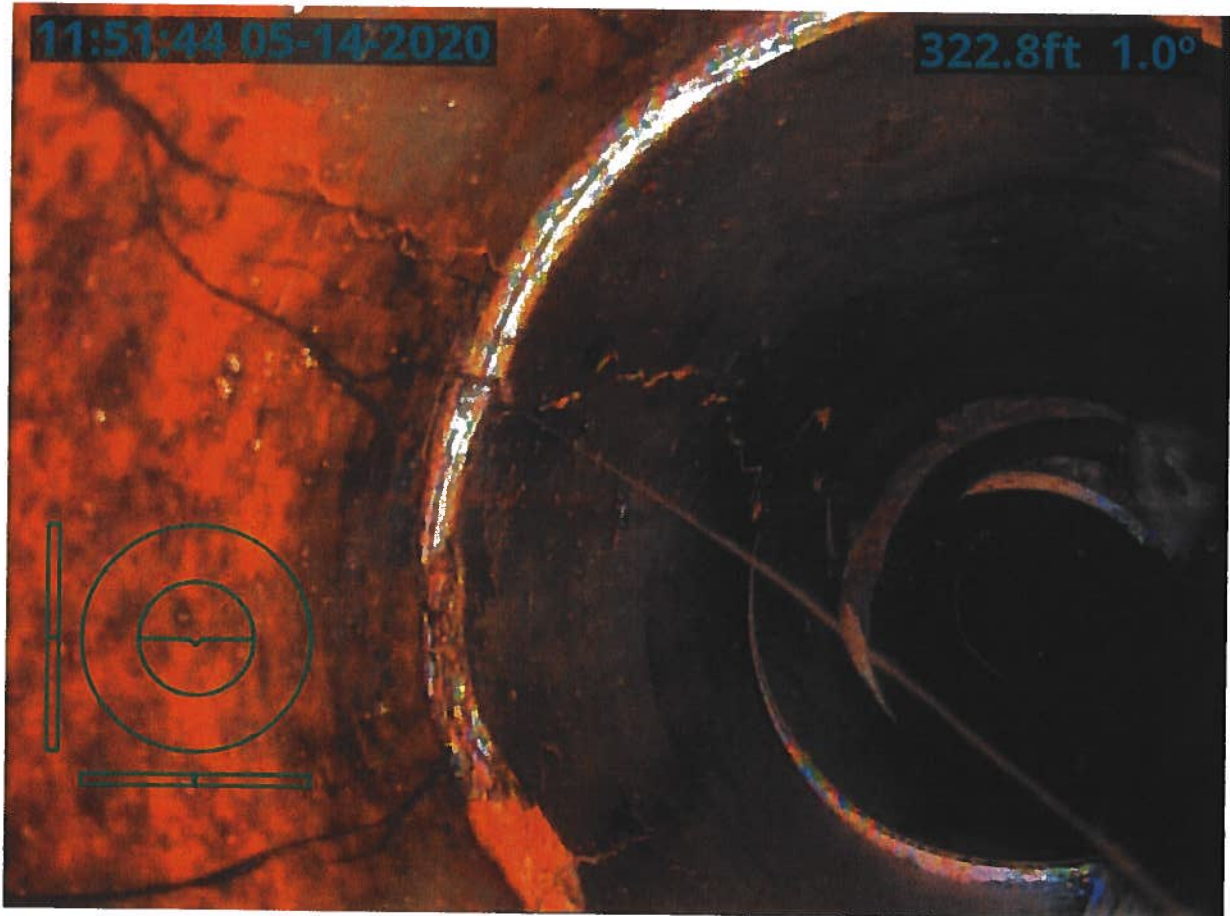
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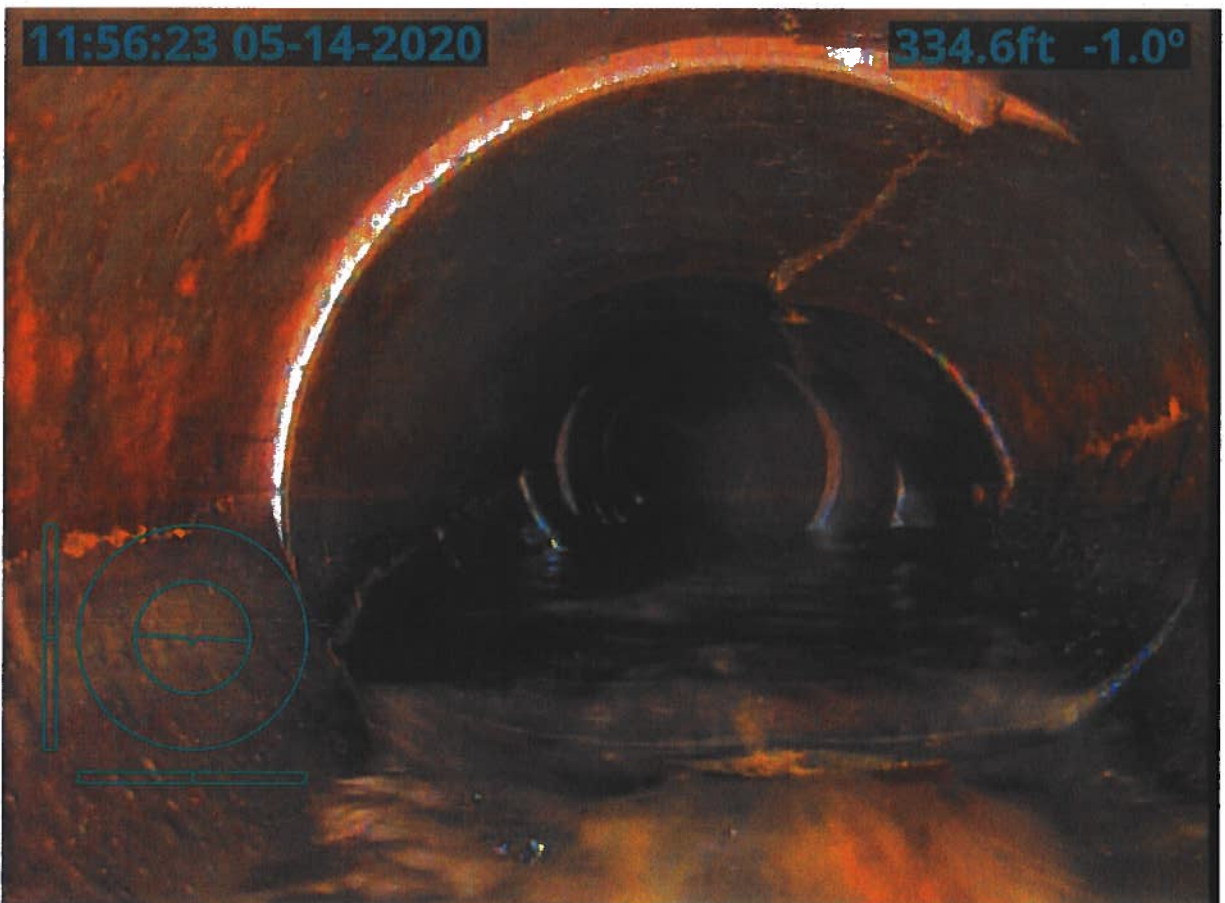
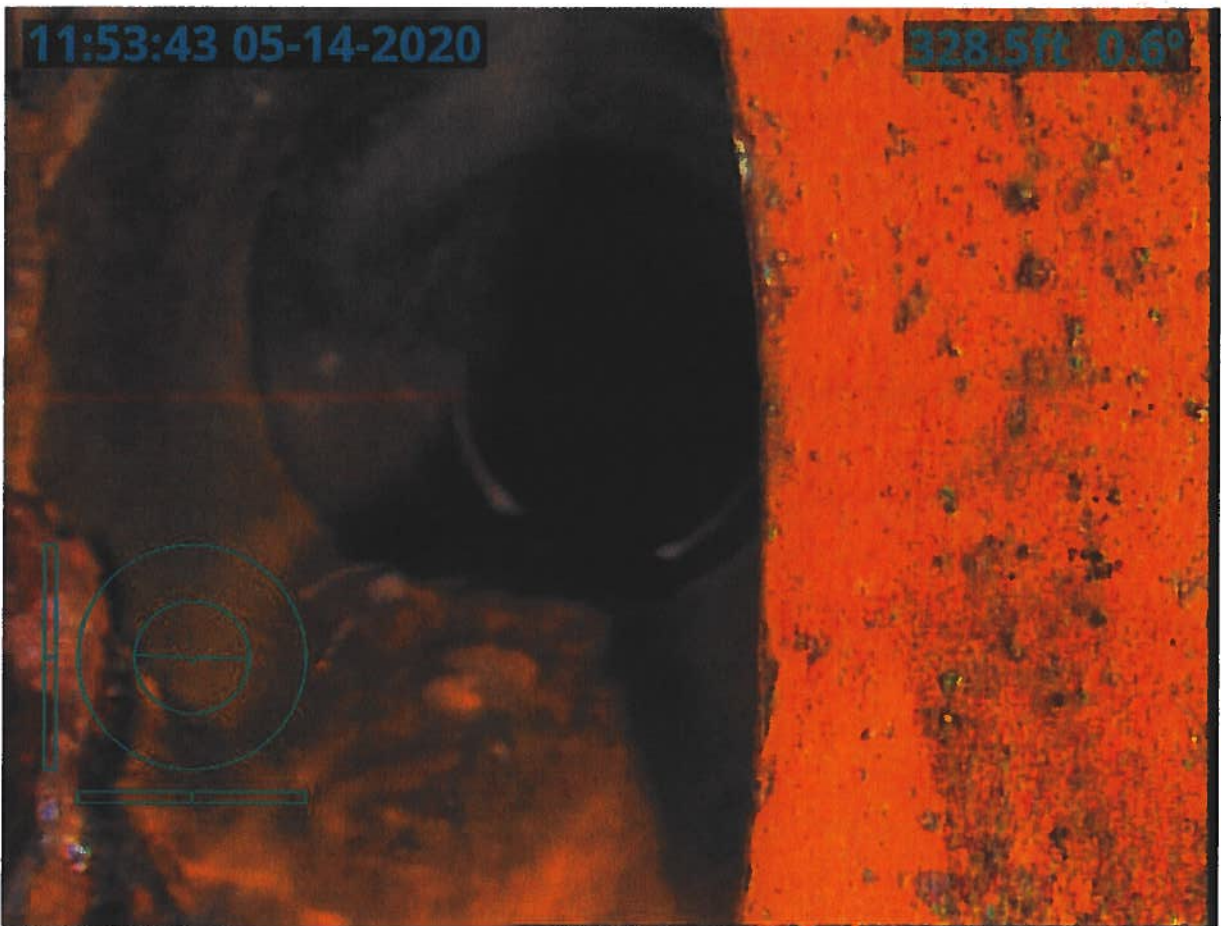
275.2ft -0.6°



11:51:44 05-14-2020

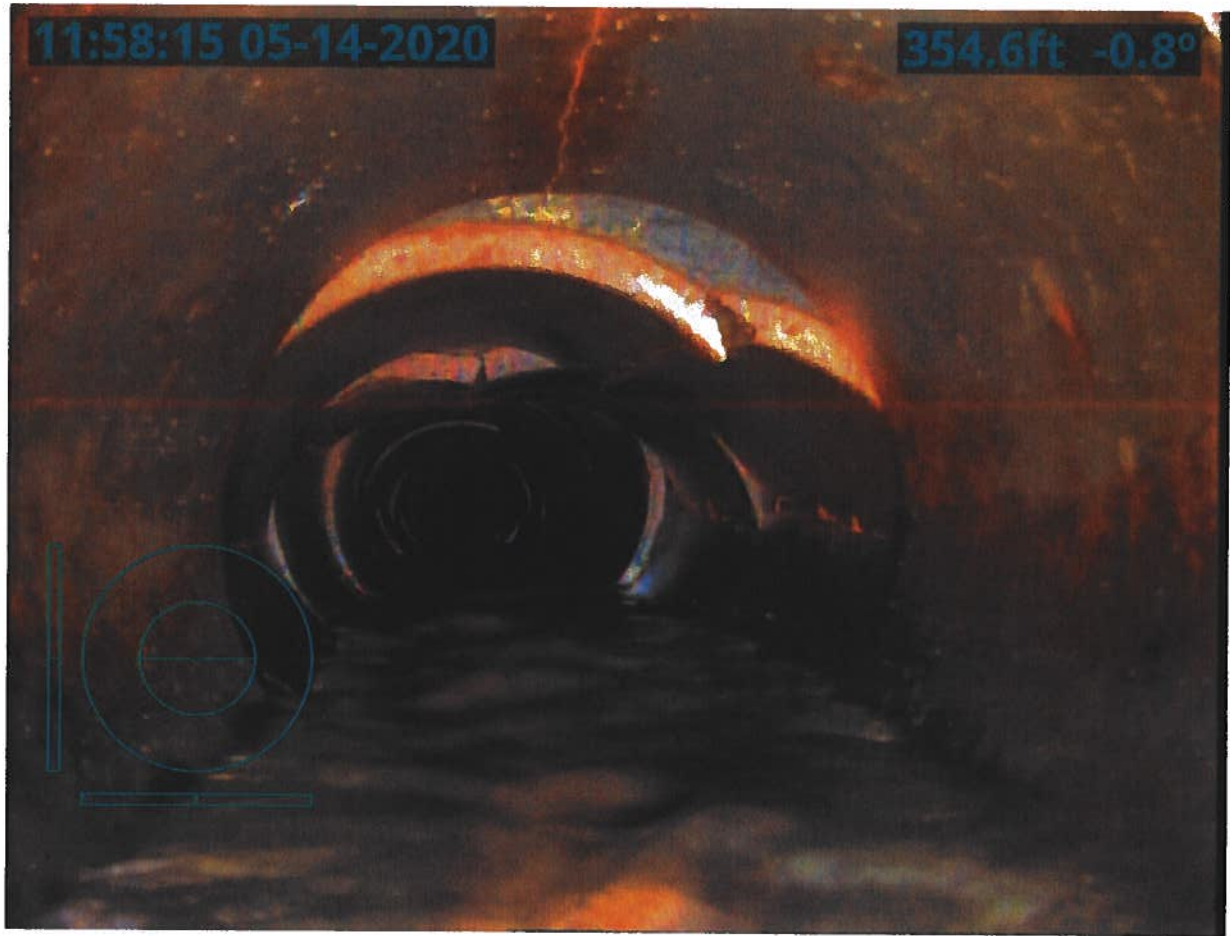
322.8ft 1.0°





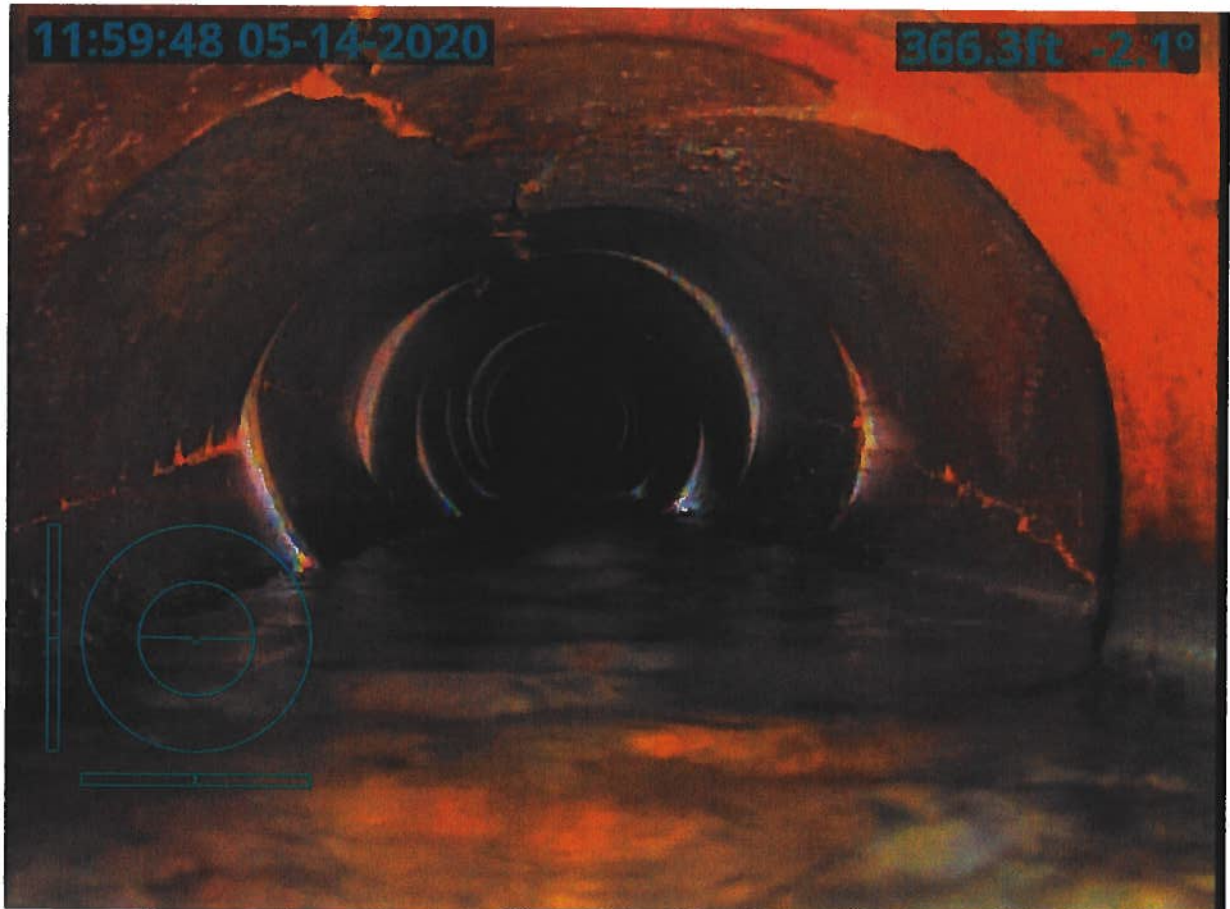
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354.6ft -0.8°



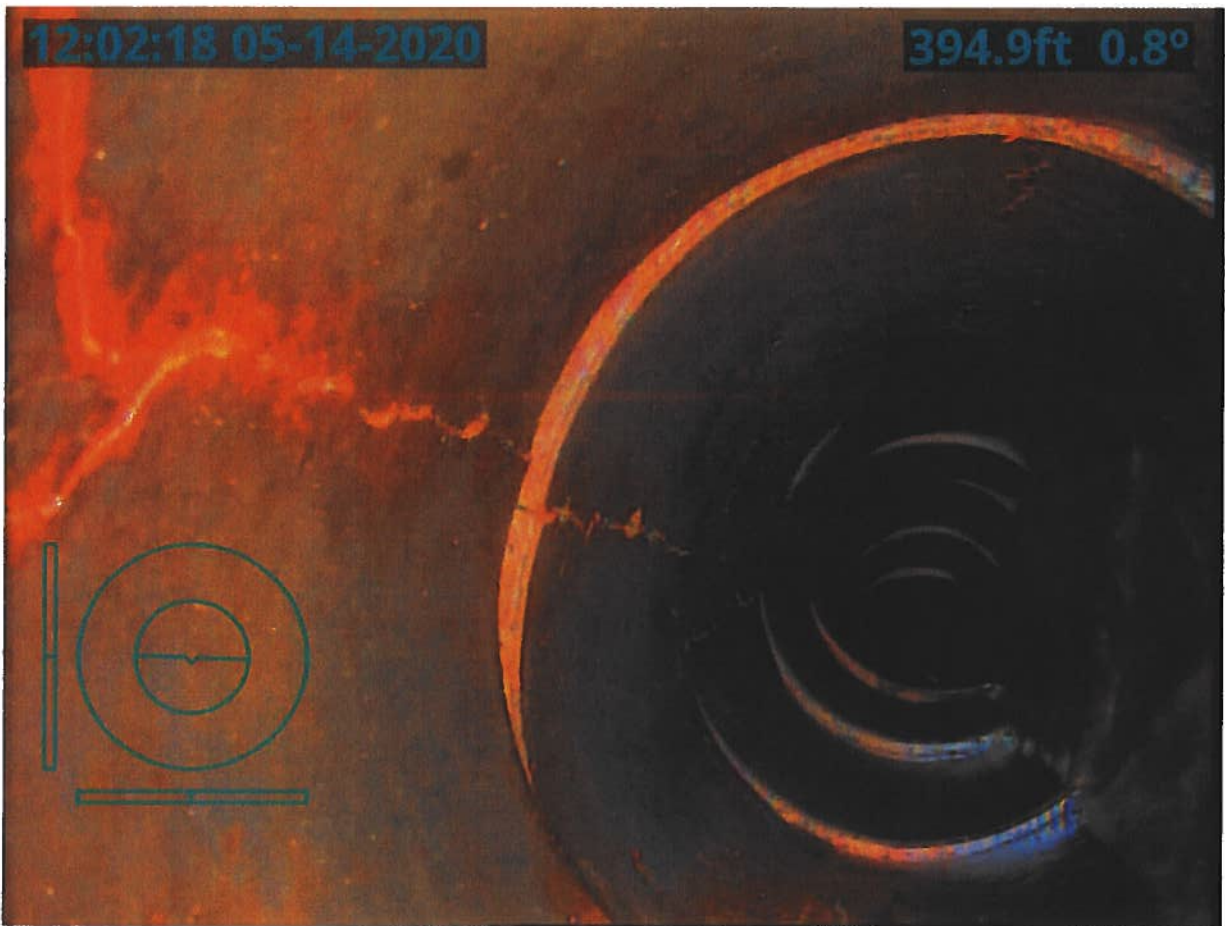
11:59:48 05-14-2020

366.3ft -2.1°



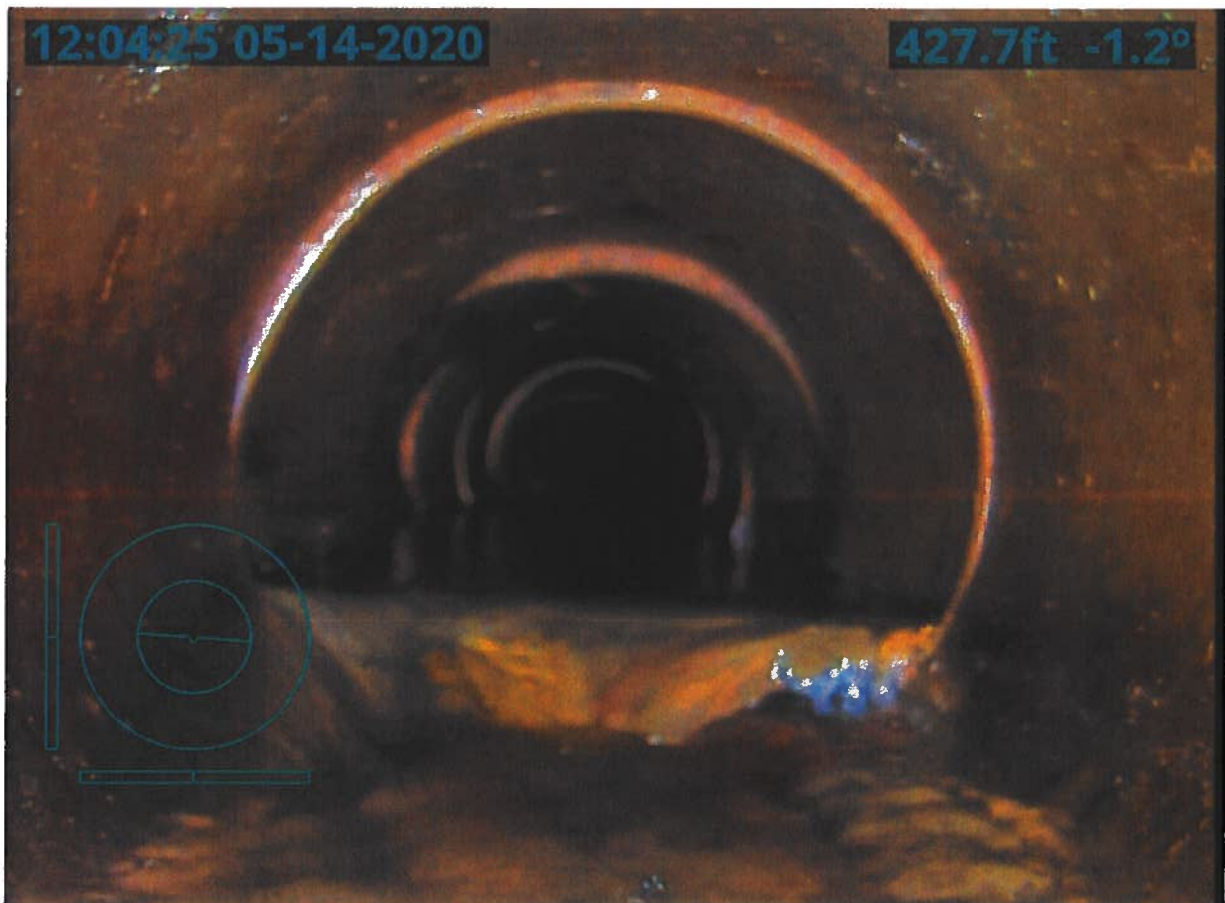
12:02:18 05-14-2020

394.9ft 0.8°



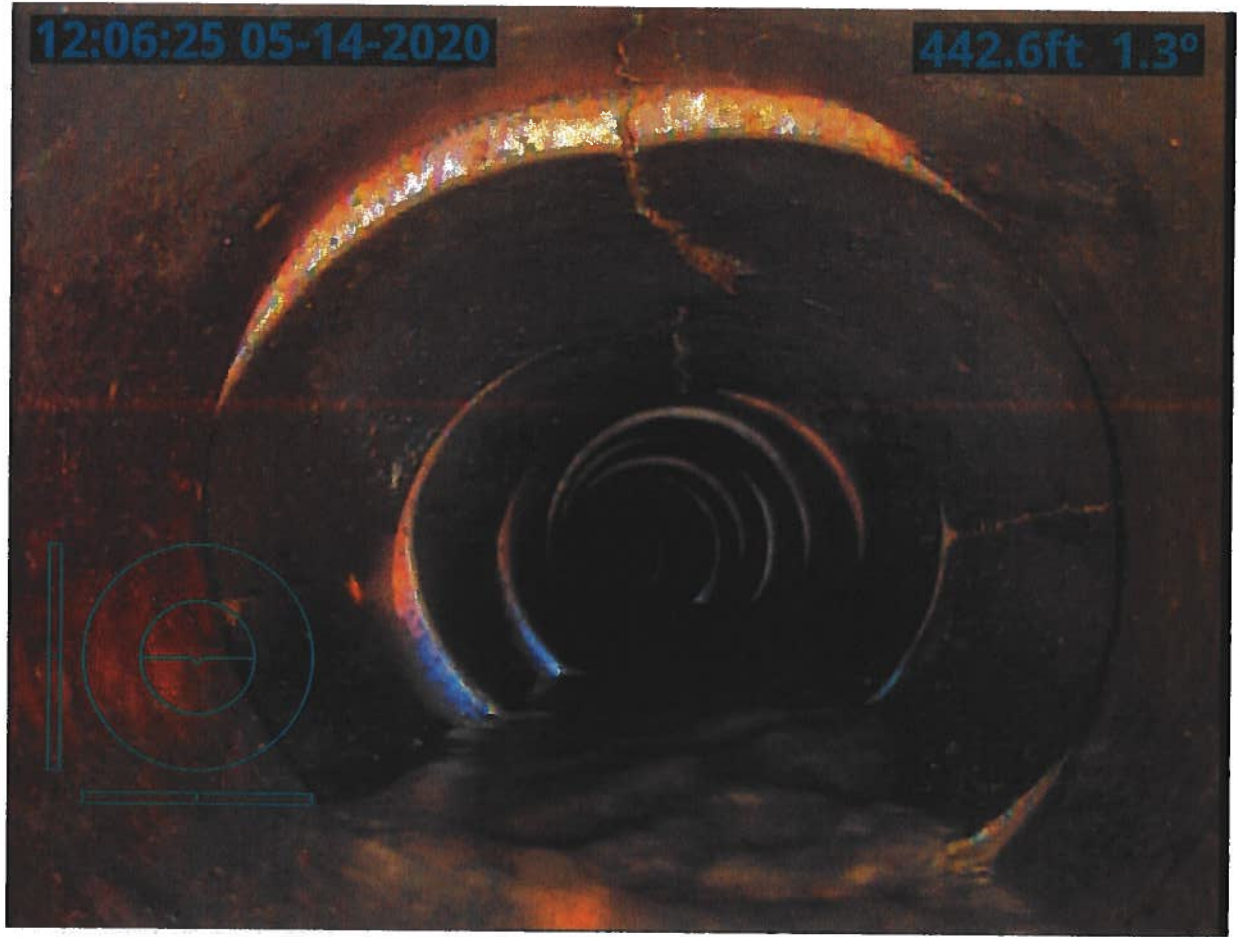
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427.7ft -1.2°



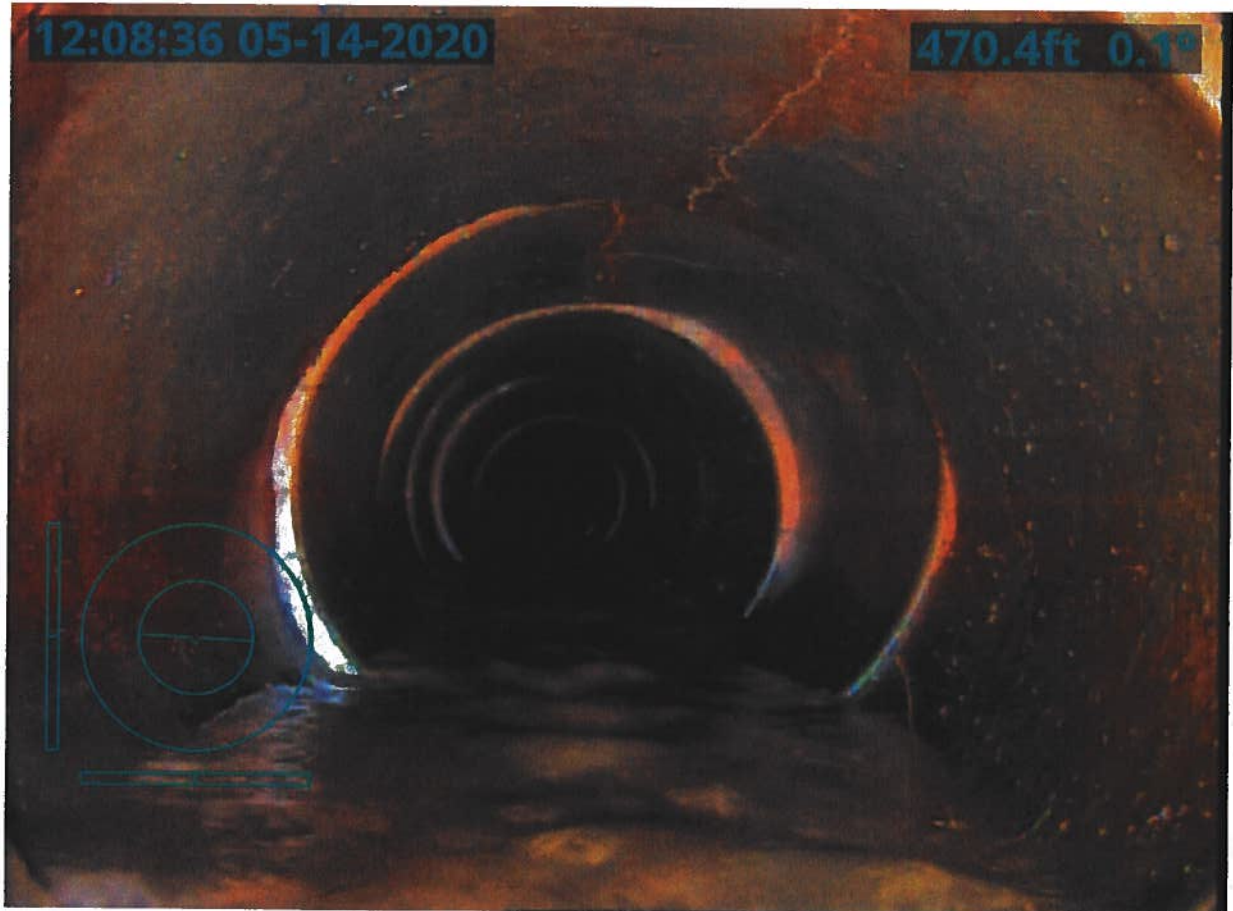
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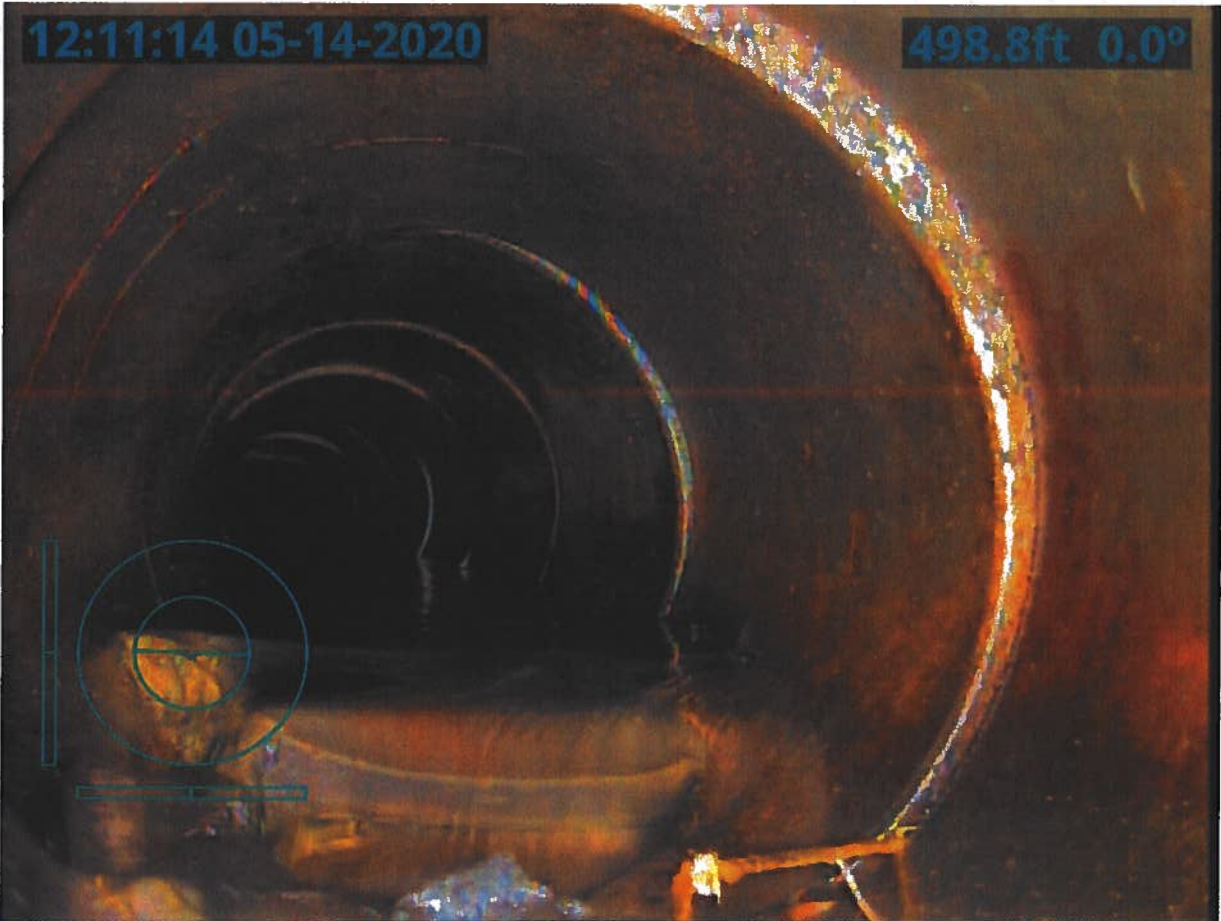
442.6ft 1.3°



12:08:36 05-14-2020

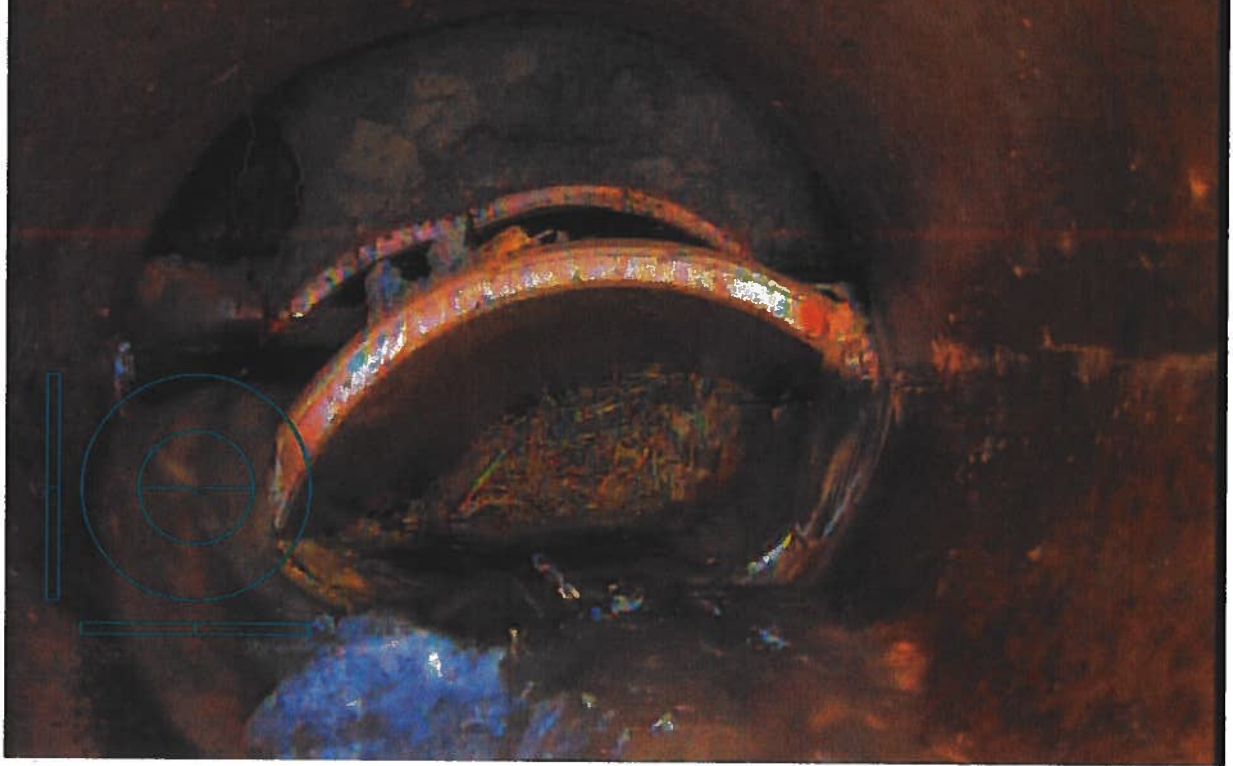
470.4ft 0.1°





12:16:39 05-14-2020

537.1ft 0.2°



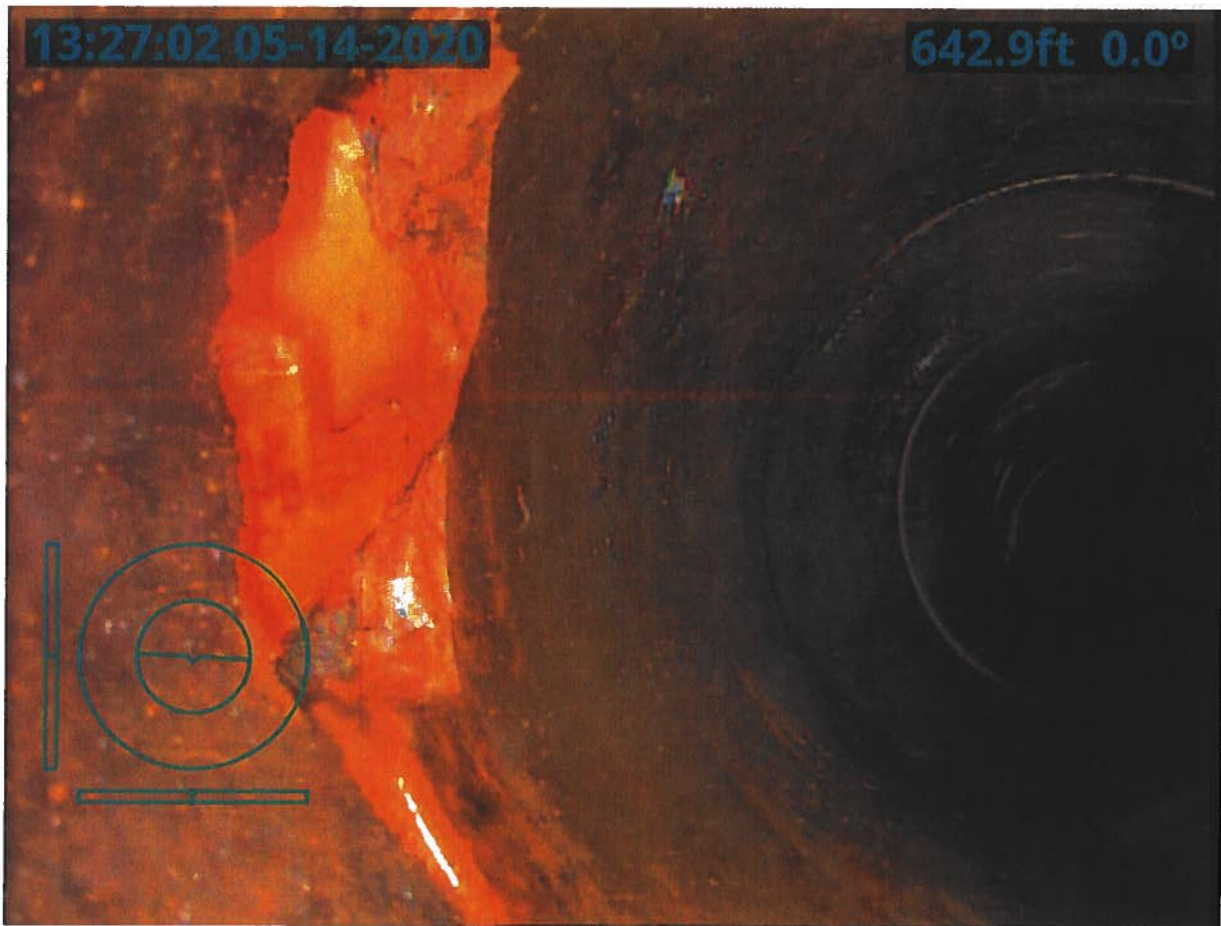
13:24:29 05-14-2020

590.2ft 1.4°



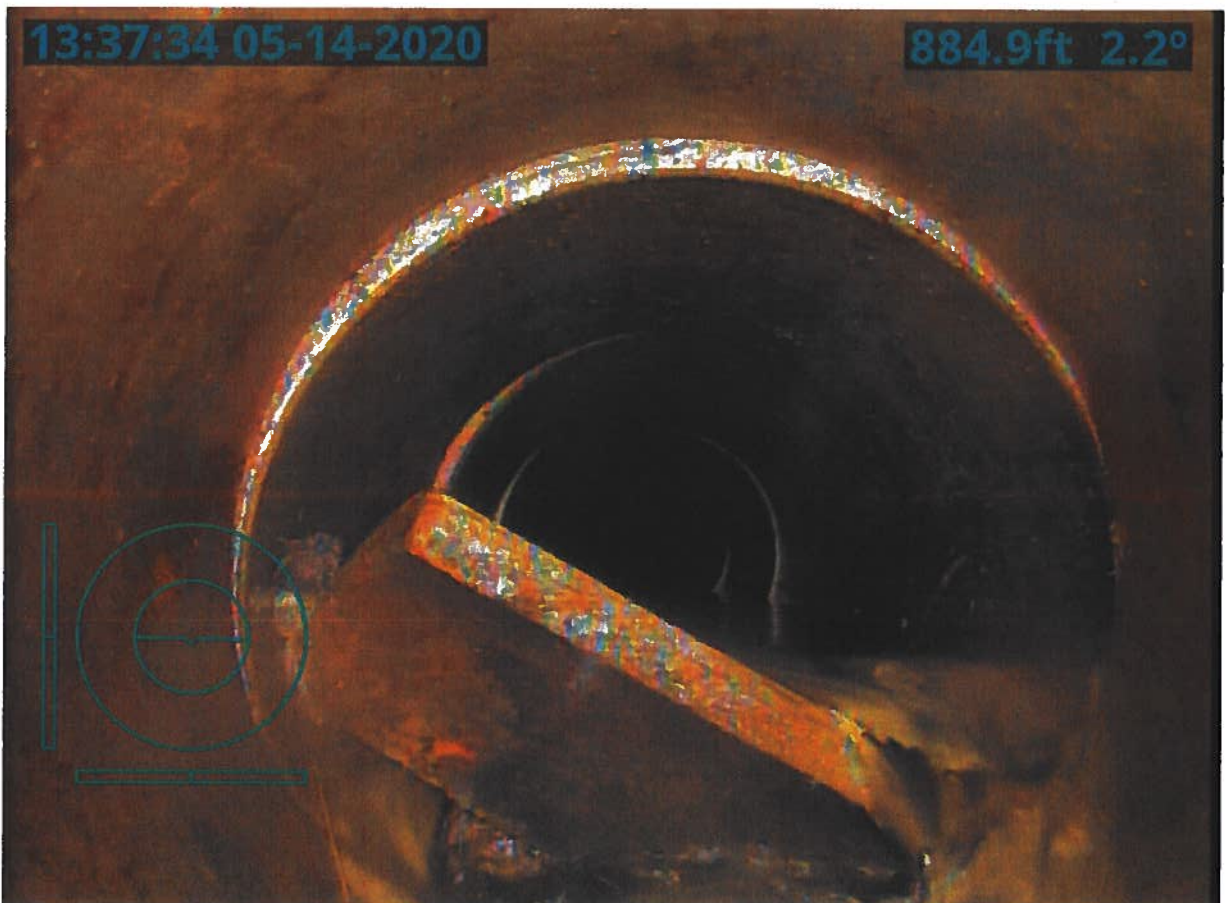
13:27:02 05-14-2020

642.9ft 0.0°



13:37:34 05-14-2020

884.9ft 2.2°



Inspection Report

Produced on behalf of – HARDIN

Site location – ,

Survey reference –

Date – 140520

WILLIAMS UNDERGROUND SVCS.

102 INDUSTRIAL DRIVVE, ACKLEY, IOWA

50601,

641-485-3925

Contents

- 1 Drain / Sewer SurveyError! Bookmark not defined.**
 - 1.1 Site informationError! Bookmark not defined.**
 - 1.2 Drain / Sewer DetailsError! Bookmark not defined.**
 - 1.3 Survey DetailsError! Bookmark not defined.**
 - 1.4 Drain / Sewer DiagramError! Bookmark not defined.**
 - 1.5 ObservationsError! Bookmark not defined.**
 - 1.6 Photographs.....Error! Bookmark not defined.**

- 2 Drain / Sewer SurveyError! Bookmark not defined.**
 - 2.1 Site informationError! Bookmark not defined.**
 - 2.2 Drain / Sewer DetailsError! Bookmark not defined.**
 - 2.3 Survey DetailsError! Bookmark not defined.**
 - 2.4 Drain / Sewer DiagramError! Bookmark not defined.**
 - 2.5 ObservationsError! Bookmark not defined.**
 - 2.6 Photographs.....Error! Bookmark not defined.**

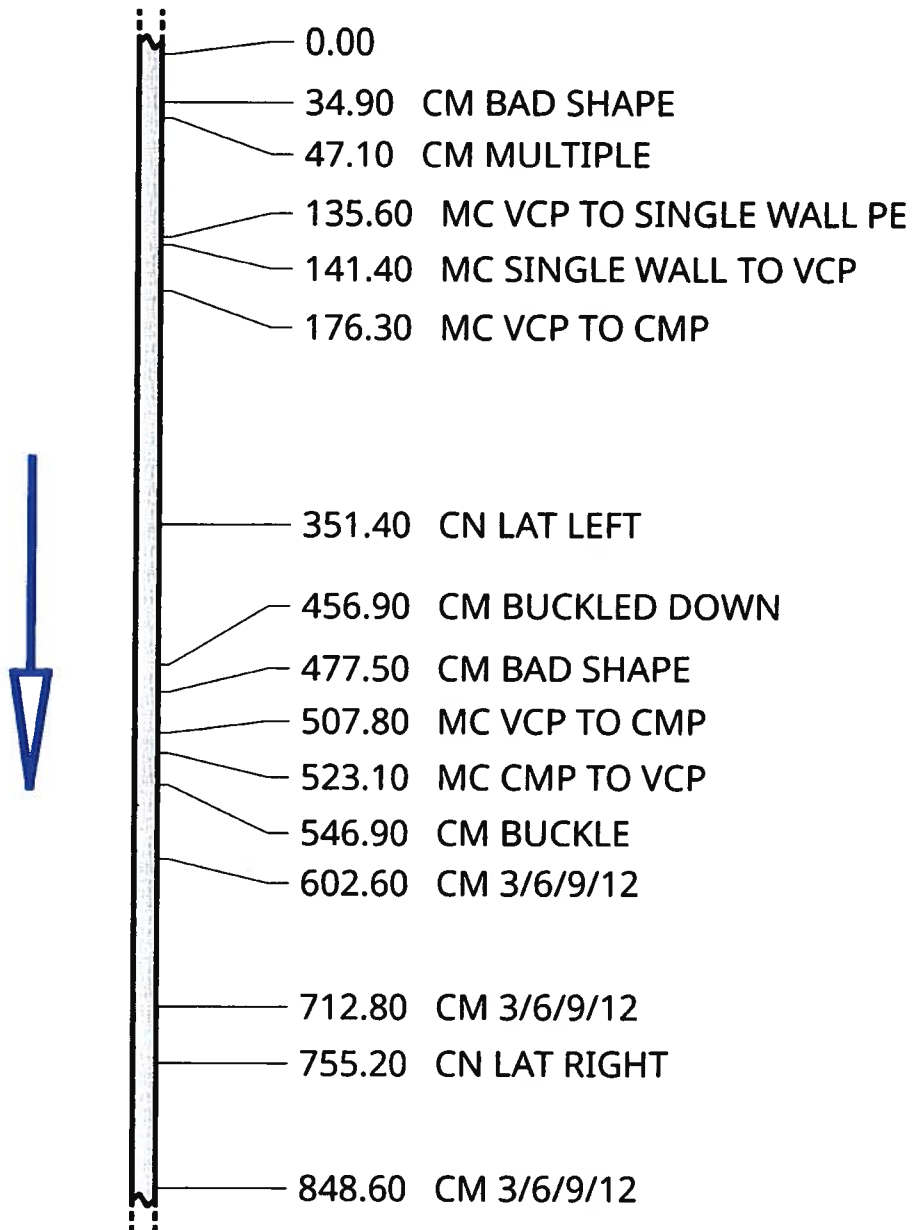
1 Drain / Sewer Survey

1.1 Survey Header











| | | |
|--------|---------------------------|---------------|
| 1.1.1 | Surveyed by (Operator) | PAUL |
| 1.1.2 | Contract no. | |
| 1.1.3 | Job no. | |
| 1.1.4 | Catchment (Drainage area) | DD14 |
| 1.1.5 | Division | |
| 1.1.6 | District | HOLE #1 |
| 1.1.7 | Pipeline length ref | 1000 |
| 1.1.8 | Date | 140520 |
| 1.1.9 | Time | 14:40 |
| 1.1.10 | Location | |
| 1.1.11 | Start manhole no. | |
| 1.1.12 | Start depth | m |
| 1.1.13 | Start cover level | |
| 1.1.14 | Start invert level | |
| 1.1.15 | Finish manhole no. | |
| 1.1.16 | Finish depth | m |
| 1.1.17 | Finish cover level | |
| 1.1.18 | Finish invert level | |
| 1.1.19 | Use of Drain | |
| 1.1.20 | Direction | D |
| 1.1.21 | Size 1 (diameter/height) | 15mm |
| 1.1.22 | Size 2 (width) | POSSIBLY 18mm |
| 1.1.23 | Shape | C |
| 1.1.24 | Material | VC |
| 1.1.25 | Lining | |
| 1.1.26 | Pipe length | 1000m |
| 1.1.27 | Total length | |
| 1.1.28 | Year laid | |
| 1.1.29 | Video cassette number | |
| 1.1.30 | Comments: General | |
| 1.1.31 | Purpose | F |
| 1.1.32 | Sewer category | Z |
| 1.1.33 | Pre-cleaning | |
| 1.1.34 | Weather | |
| 1.1.35 | Location code | |
| 1.1.36 | Further location details | |







1.2 Diagram

[page 1/1]



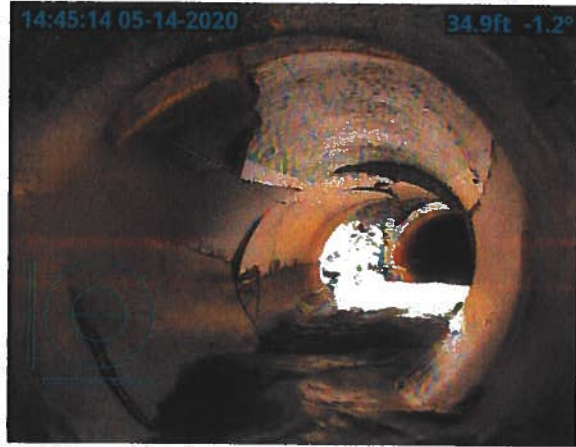
1.3 Observations

| Video Ref | Dist (ft) | Cont Defect | Code | Photo Ref | Diameter/ Dimension | Clock | | Intrusion | | Remarks |
|-----------|-----------|-------------|------|--|------------------------|-------|----|-----------|----|-----------------------|
| | | | | | | At | To | % | mm | |
| 0:02:43 | 34.9 | | CM | 2020_05_14-14_45_14_552.jpg  | | 08 | 02 | | | BAD SHAPE |
| 0:03:29 | 47.1 | | CM | 2020_05_14-14_46_35_553.jpg  | | 08 | 04 | | | MULTIPLE |
| 0:06:19 | 135.6 | | MC | 2020_05_14-14_49_57_525.jpg  | | | | | | VCP TO SINGLE WALL PE |
| 0:07:03 | 141.4 | | MC | 2020_05_14-14_51_51_164.jpg  | | | | | | SINGLE WALL TO VCP |
| 0:08:02 | 176.3 | | MC | 2020_05_14-14_53_09_064.jpg  | | | | | | VCP TO CMP |
| 0:19:16 | 351.4 | | CN | 2020_05_14-15_04_38_643.jpg  | 4? | 10 | | | | LAT LEFT |
| 0:22:26 | 456.9 | | CM | 2020_05_14-15_08_30_218.jpg  | | 08 | 04 | | | BUCKLED DOWN |
| 0:23:48 | 477.5 | | CM | 2020_05_14-15_13_40_522.jpg  | | 08 | 03 | | | BAD SHAPE |
| 0:25:02 | 507.8 | | MC | 2020_05_14-15_15_19_324.jpg  | | | | | | VCP TO CMP |
| 0:27:07 | 523.1 | | MC | 2020_05_14-15_17_43_224.jpg  | | | | | | CMP TO VCP |

| Video Ref | Dist (ft) | Cont Defect | Code | Photo Ref | Diameter/ Dimension | Clock | | Intrusion | | Remarks |
|-----------|-----------|-------------|------|--|------------------------|-------|----|-----------|----|-----------|
| | | | | | | At | To | % | mm | |
| | | | |  | | | | | | |
| 0:28:36 | 546.9 | | CM | 2020_05_14-15_19_32_358.jpg  | | 11 | 04 | | | BUCKLE |
| 0:30:08 | 602.6 | | CM | 2020_05_14-15_21_29_661.jpg  | | 12 | 11 | | | 3/6/9/12 |
| 0:33:47 | 712.8 | | CM | 2020_05_14-15_25_39_785.jpg  | | 01 | 12 | | | 3/6/9/12 |
| 0:35:56 | 755.2 | | CN | 2020_05_14-15_28_19_497.jpg  | 4? | 02 | | | | LAT RIGHT |
| 0:38:02 | 848.6 | | CM | 2020_05_14-15_30_54_138.jpg  | | 01 | 12 | | | 3/6/9/12 |

1.4 Photographs

CM 2020_05_14-14_45_14_552.jpg



MC 2020_05_14-14_51_51_164.jpg



CM 2020_05_14-14_46_35_553.jpg



MC 2020_05_14-14_53_09_064.jpg



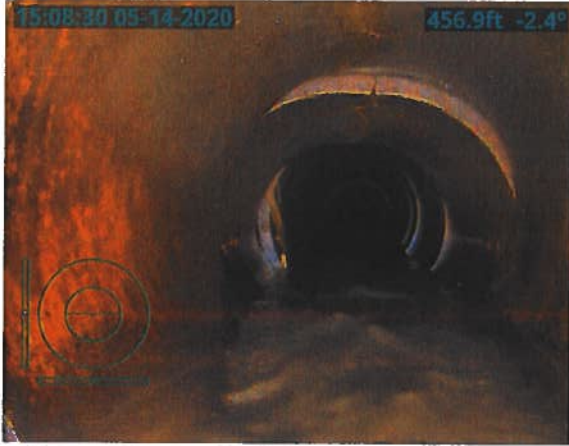
MC 2020_05_14-14_49_57_525.jpg



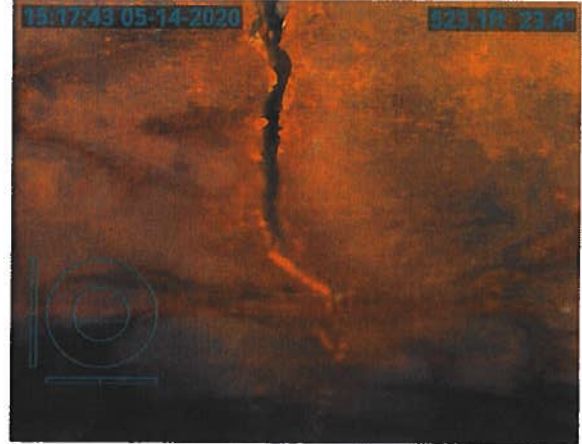
CN 2020_05_14-15_04_38_643.jpg



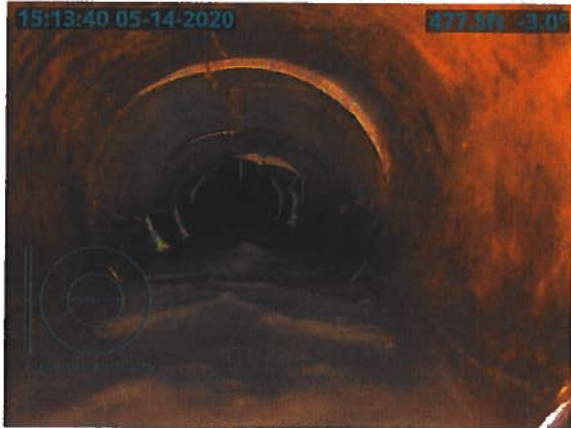
CM 2020_05_14-15_08_30_218.jpg



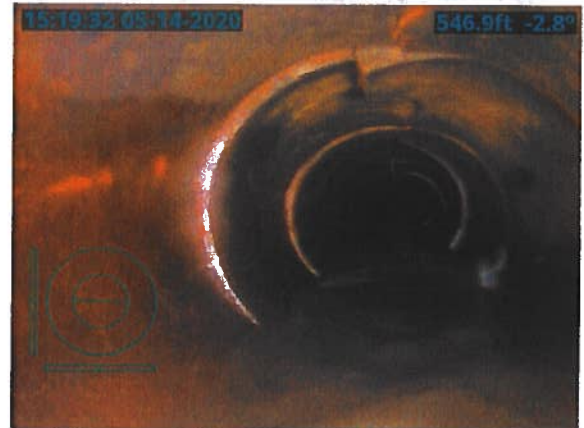
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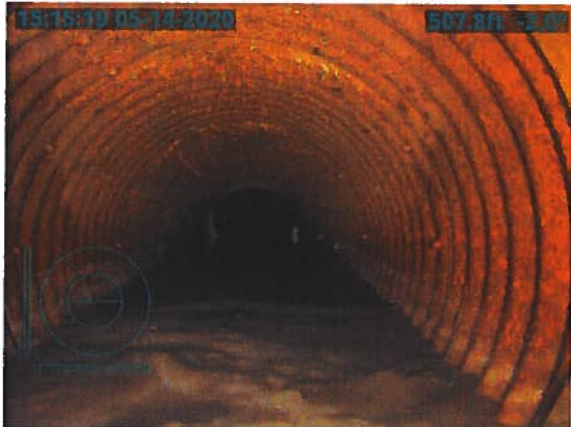
CM 2020_05_14-15_13_40_522.jpg



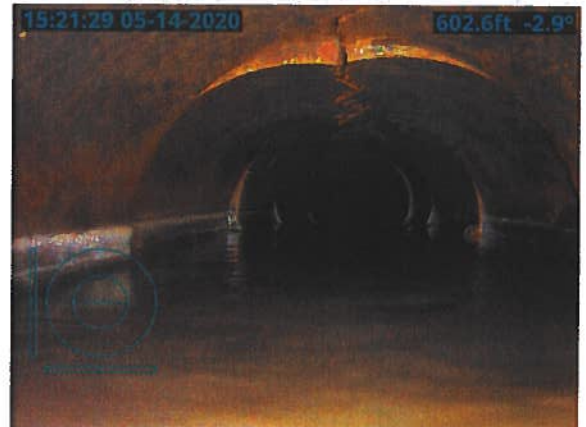
CM 2020_05_14-15_19_32_358.jpg



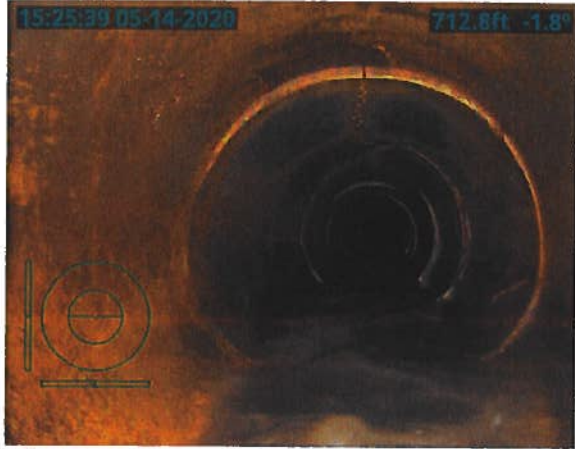
MC 2020_05_14-15_15_19_324.jpg



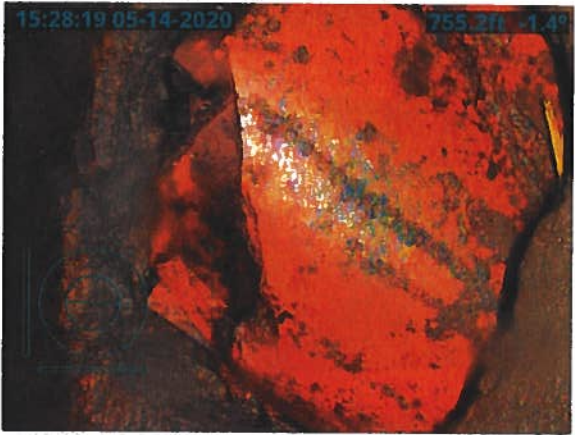
CM 2020_05_14-15_21_29_661.jpg



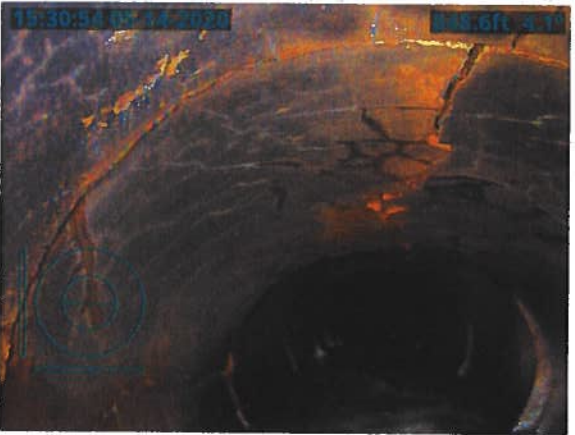
CM 2020_05_14-15_25_39_785.jpg



CN 2020_05_14-15_28_19_497.jpg

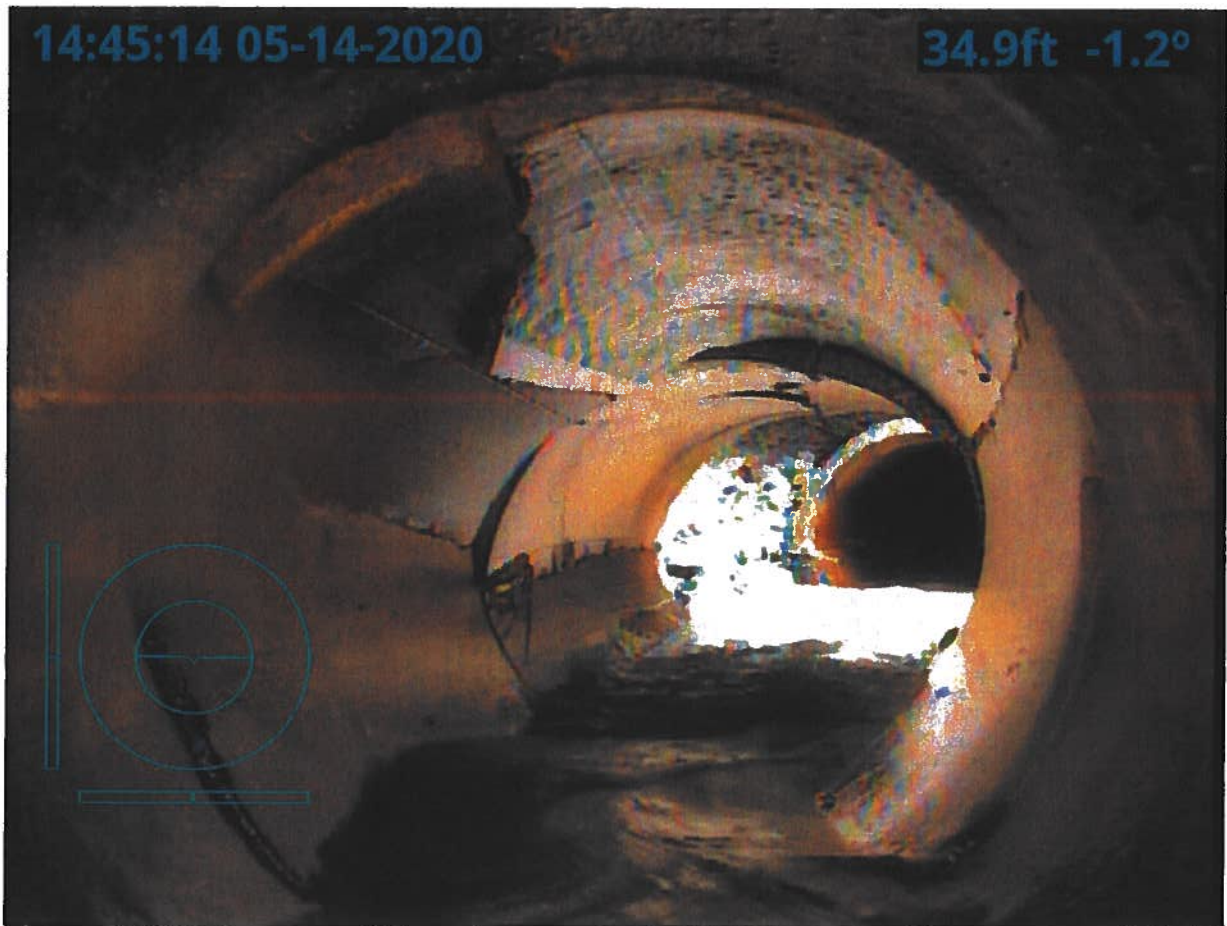


CM 2020_05_14-15_30_54_138.jpg



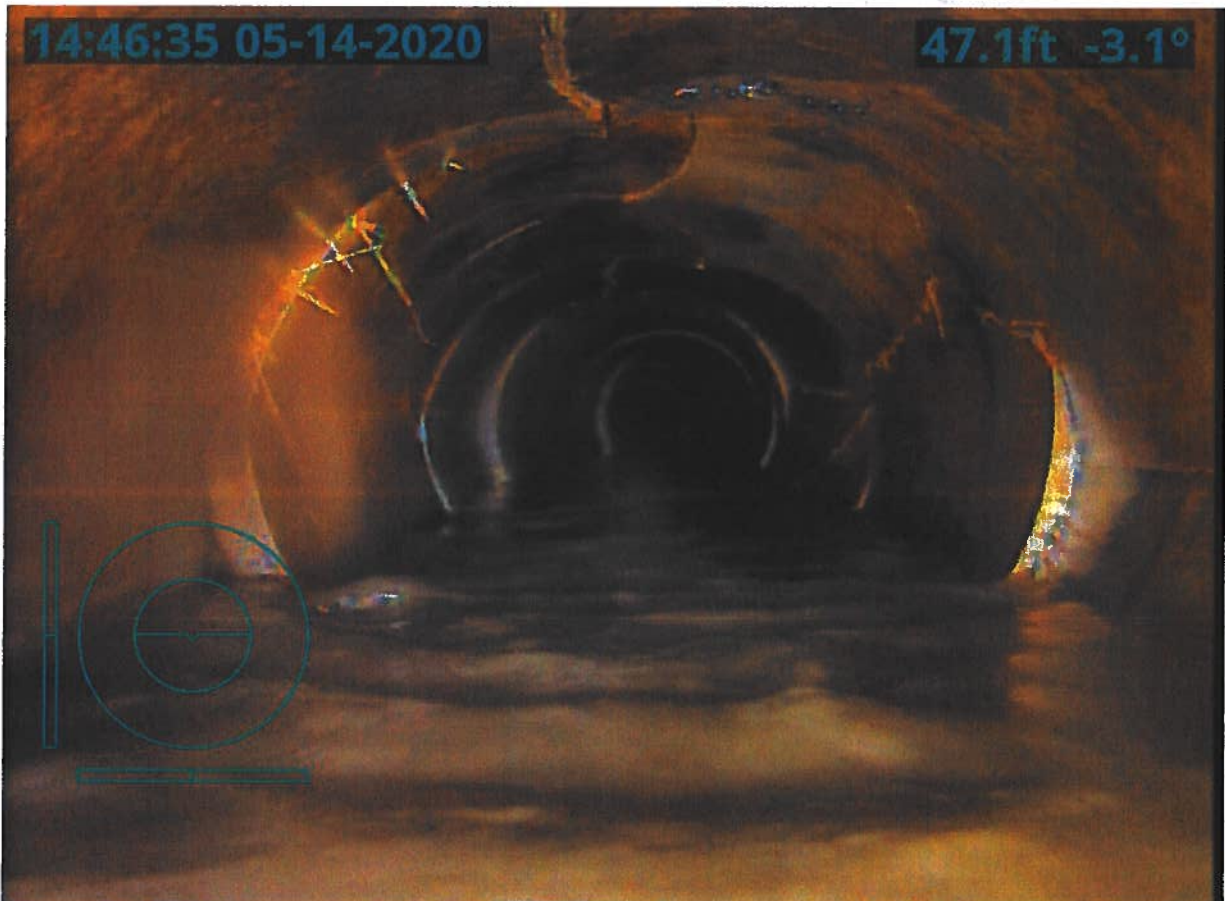
14:45:14 05-14-2020

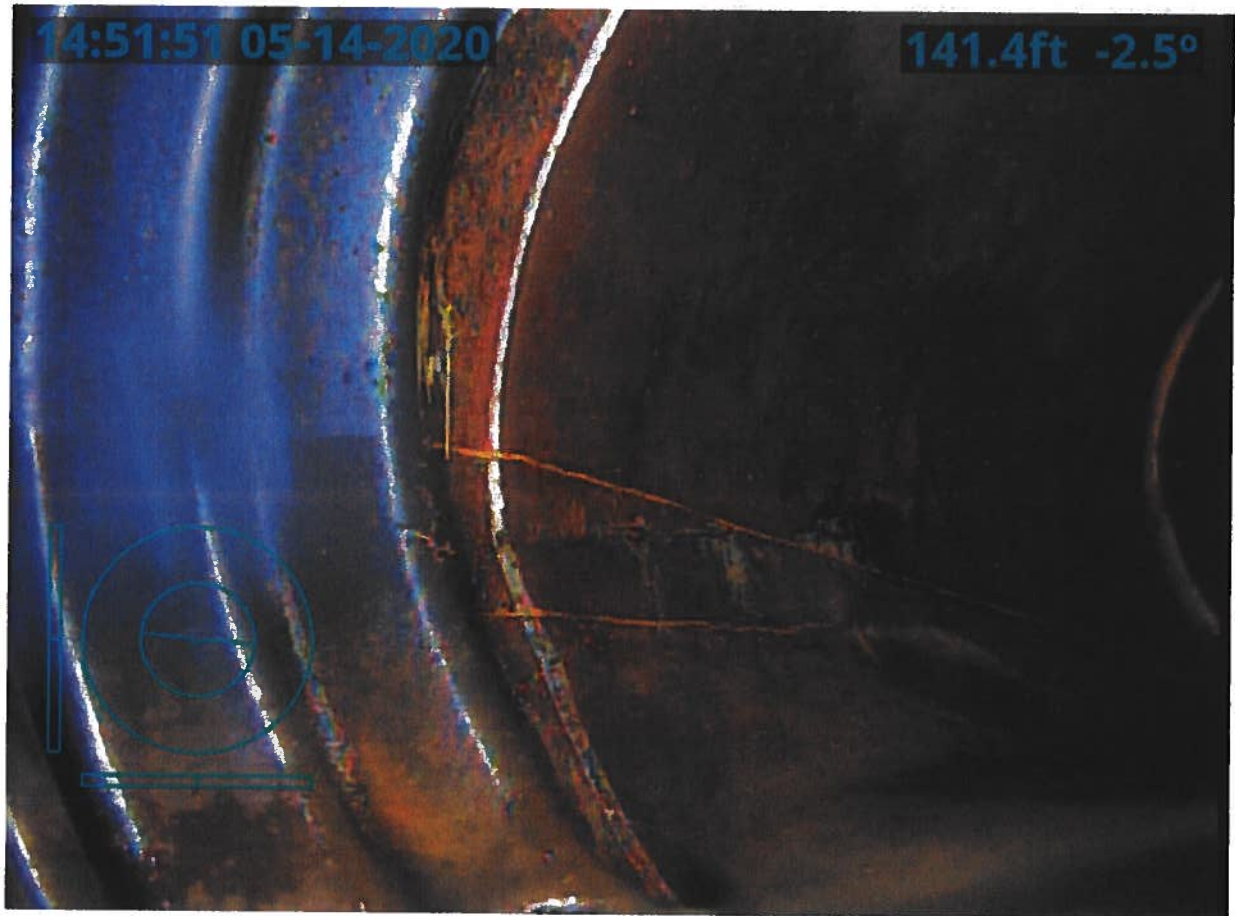
34.9ft -1.2°

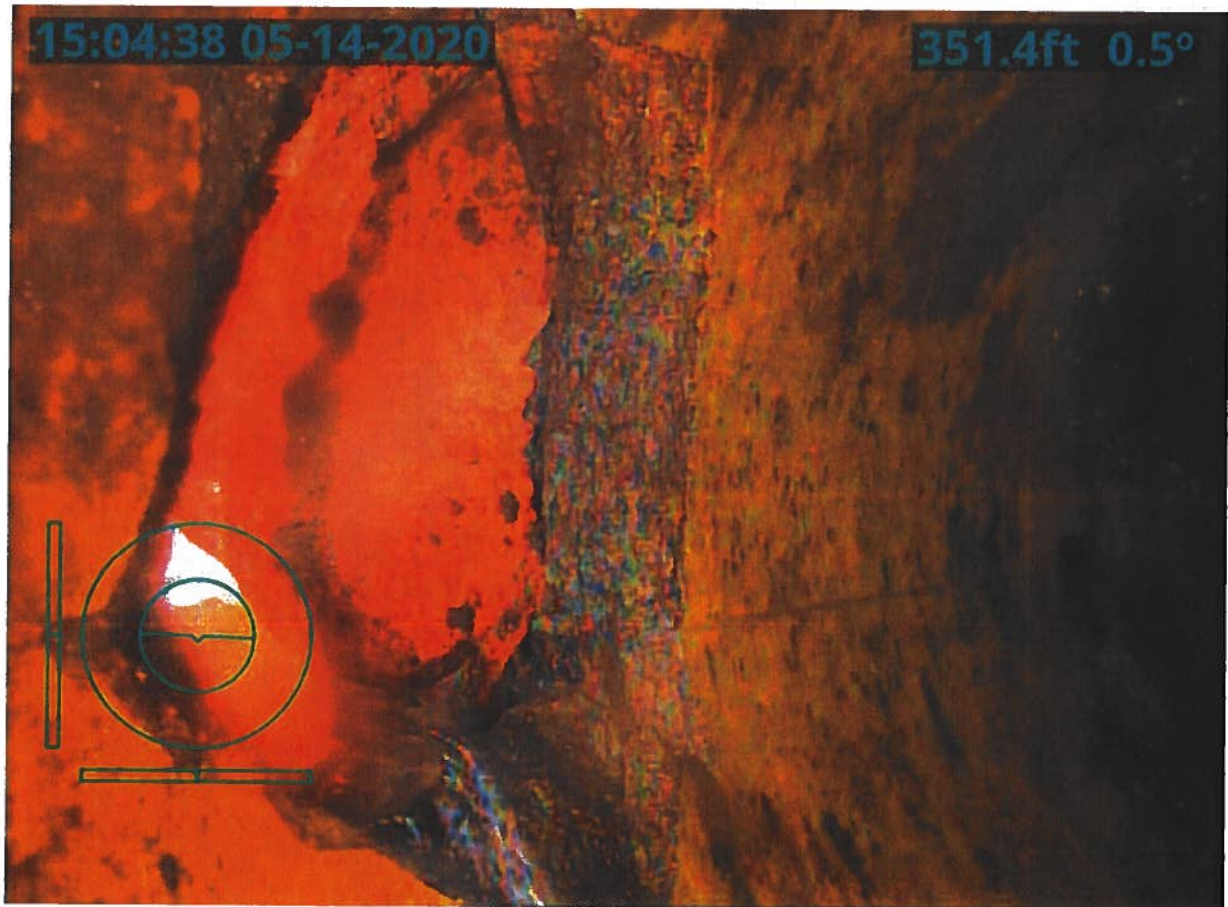
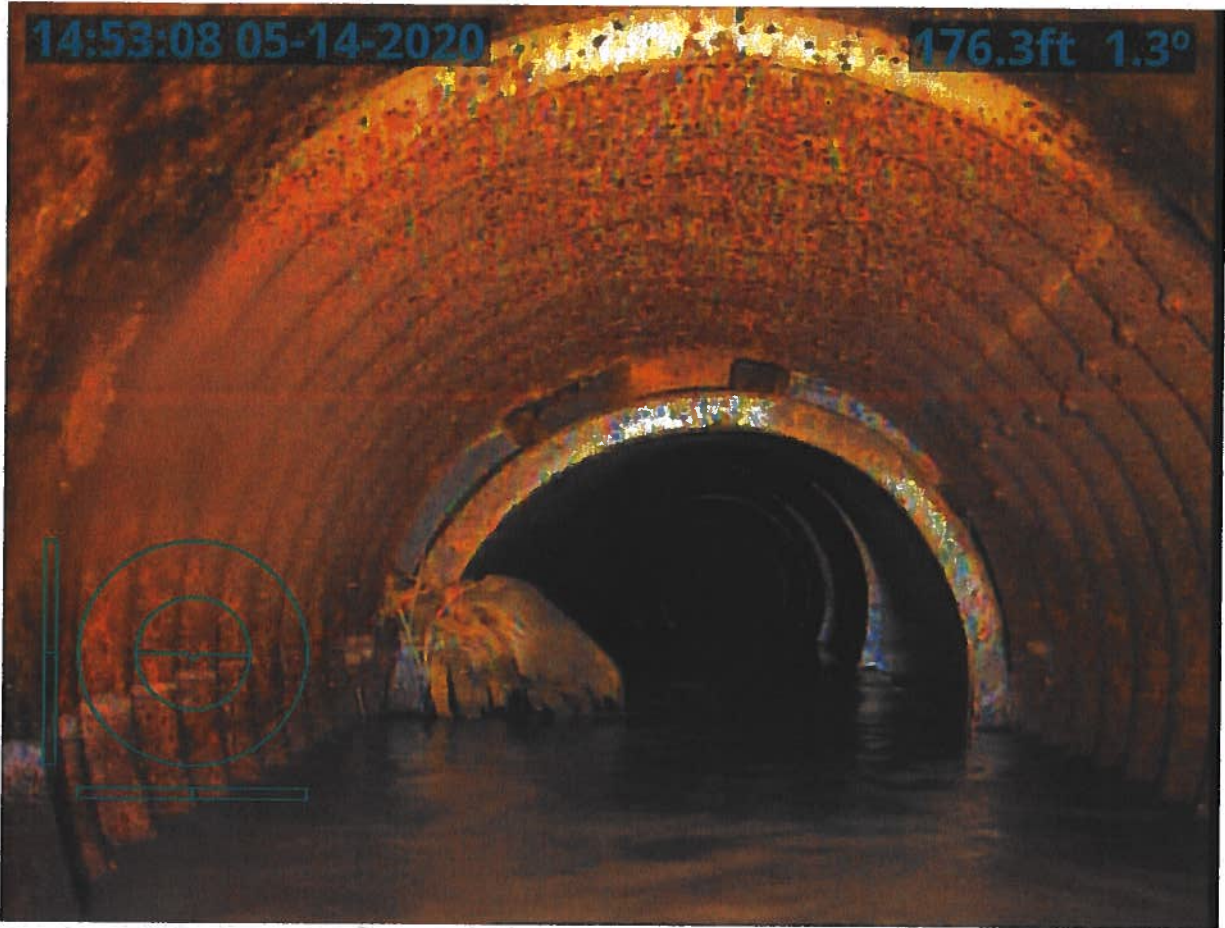


14:46:35 05-14-2020

47.1ft -3.1°

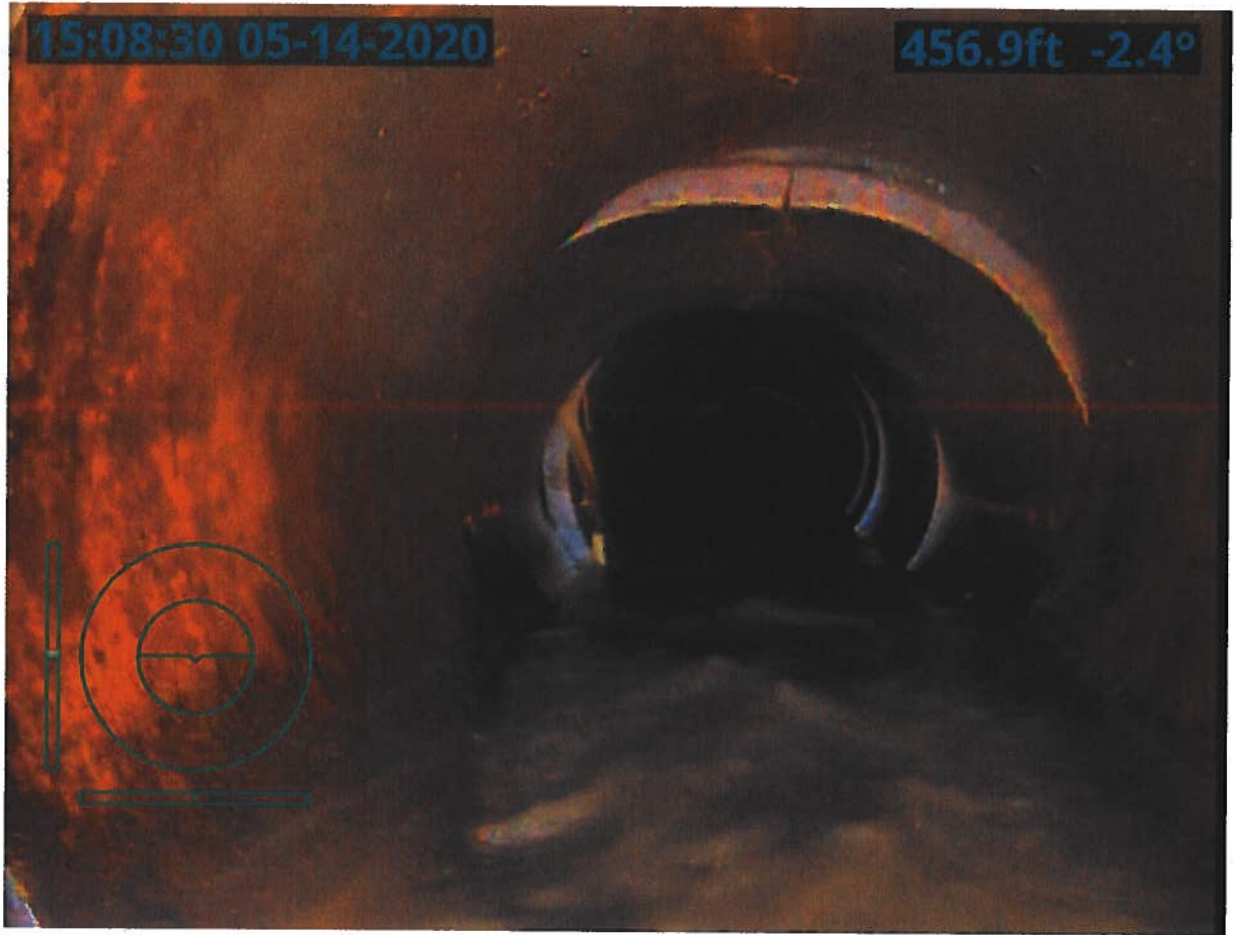






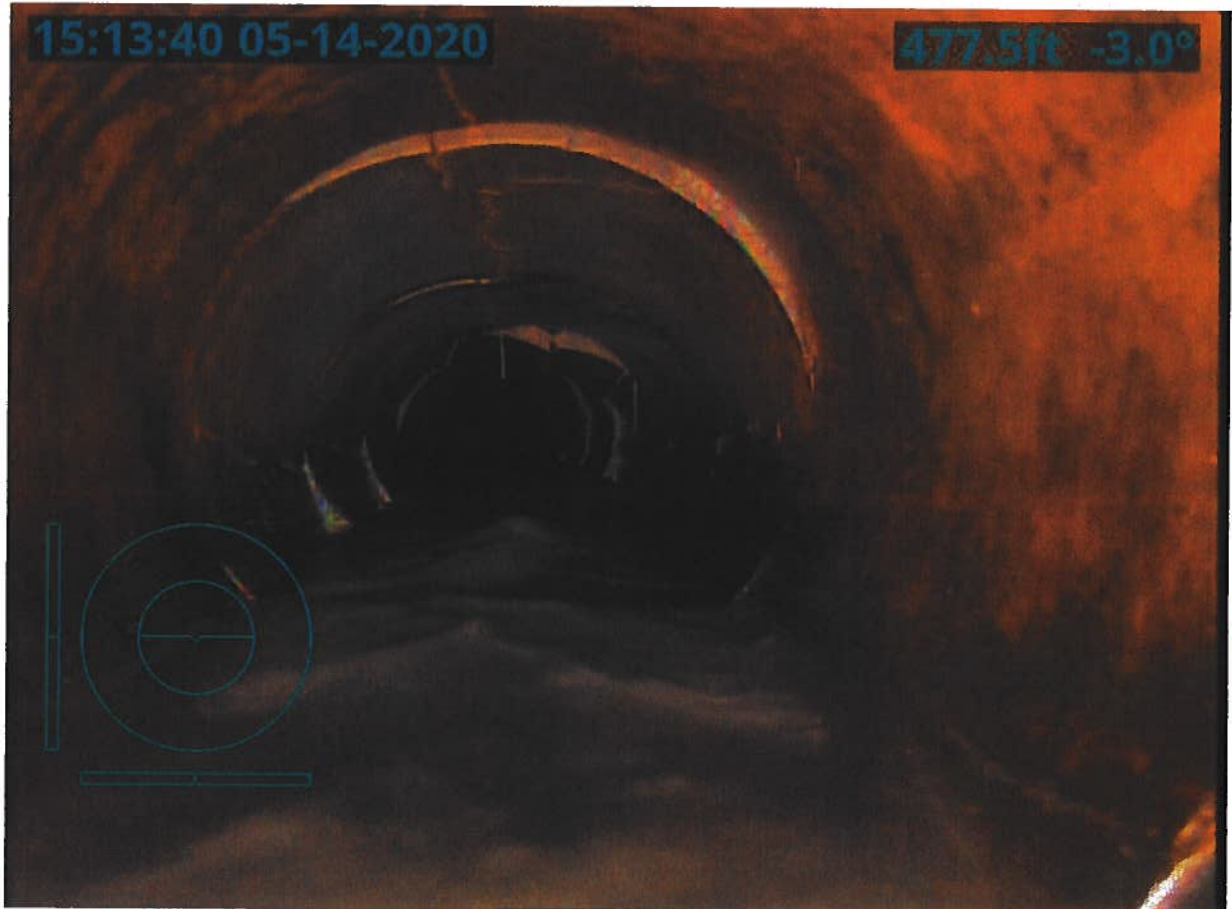
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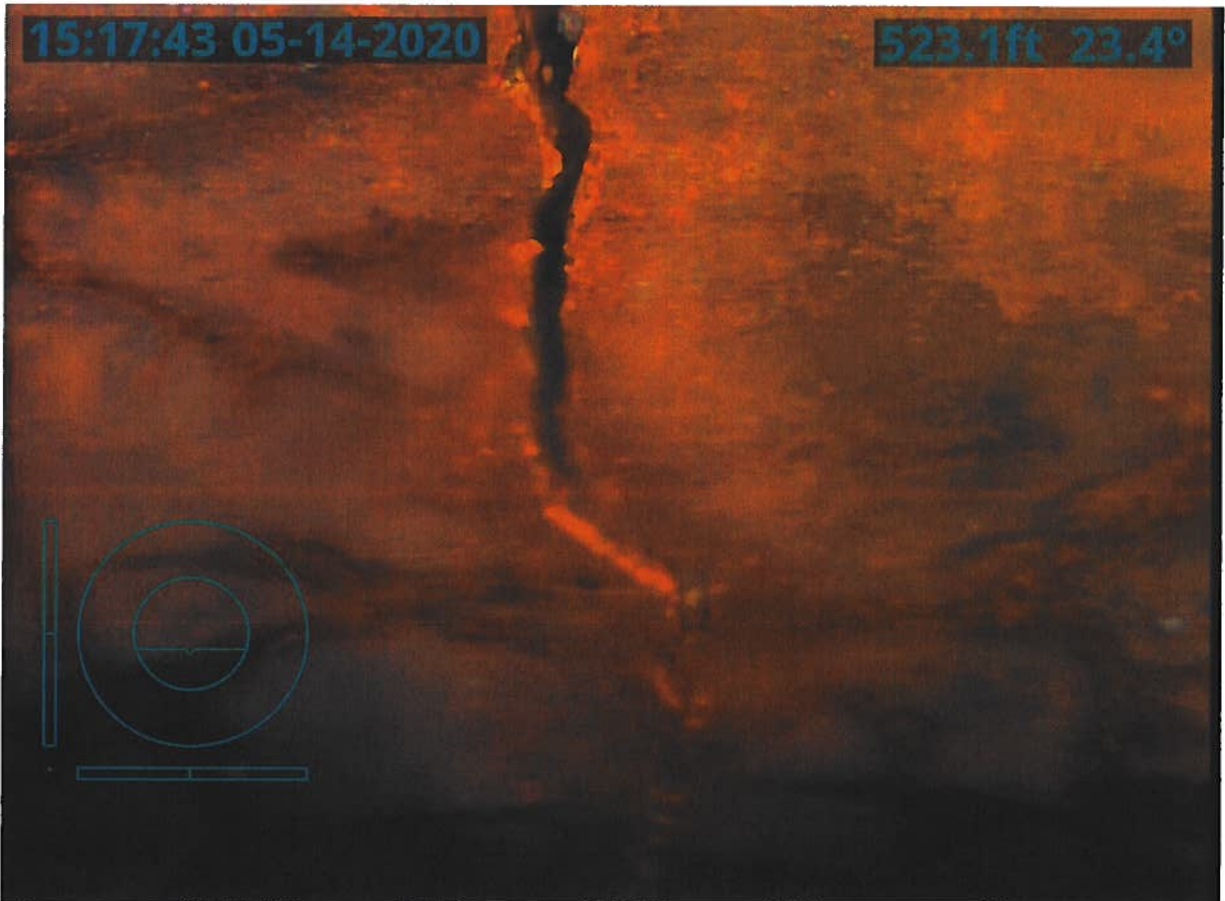
456.9ft -2.4°



15:13:40 05-14-2020

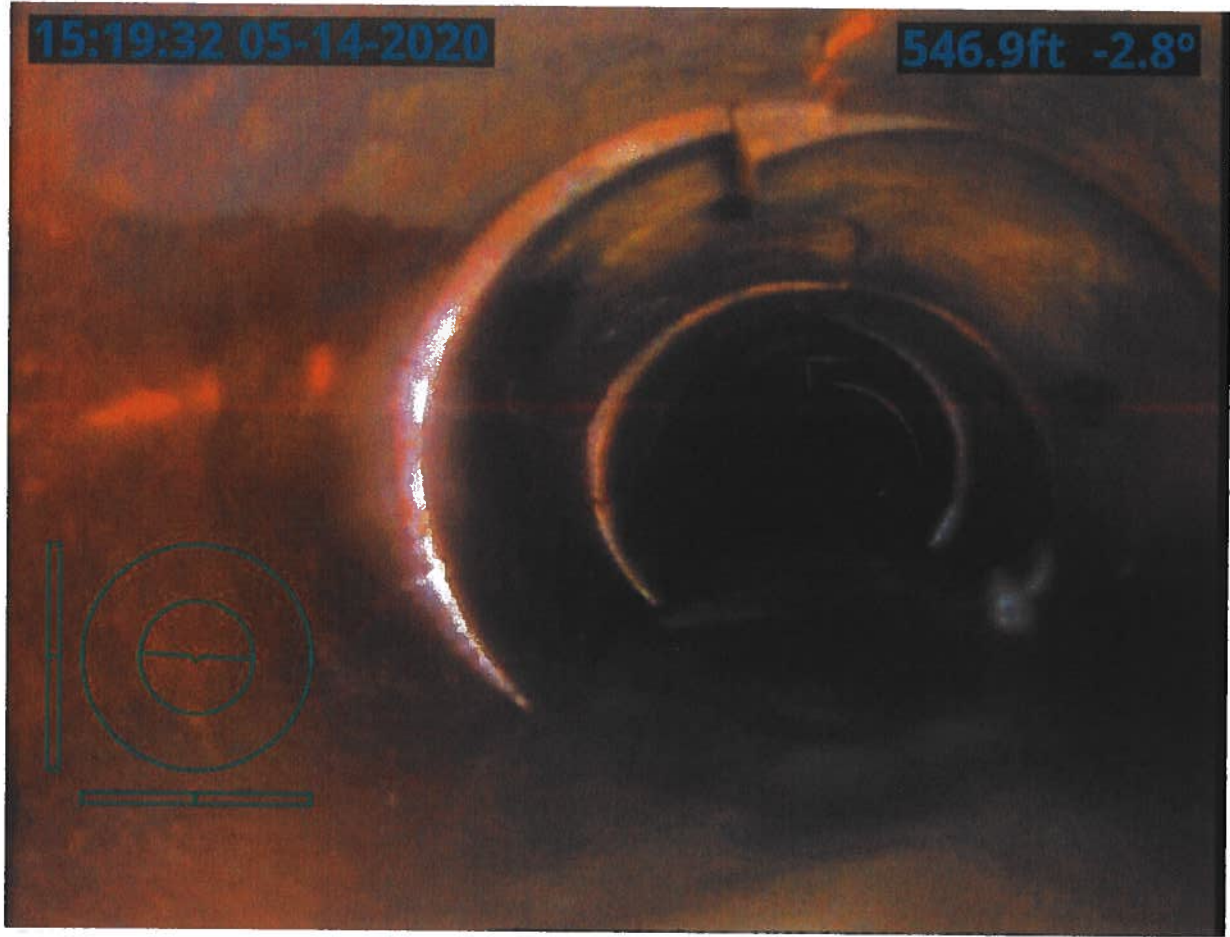
477.5ft -3.0°





15:19:32 05-14-2020

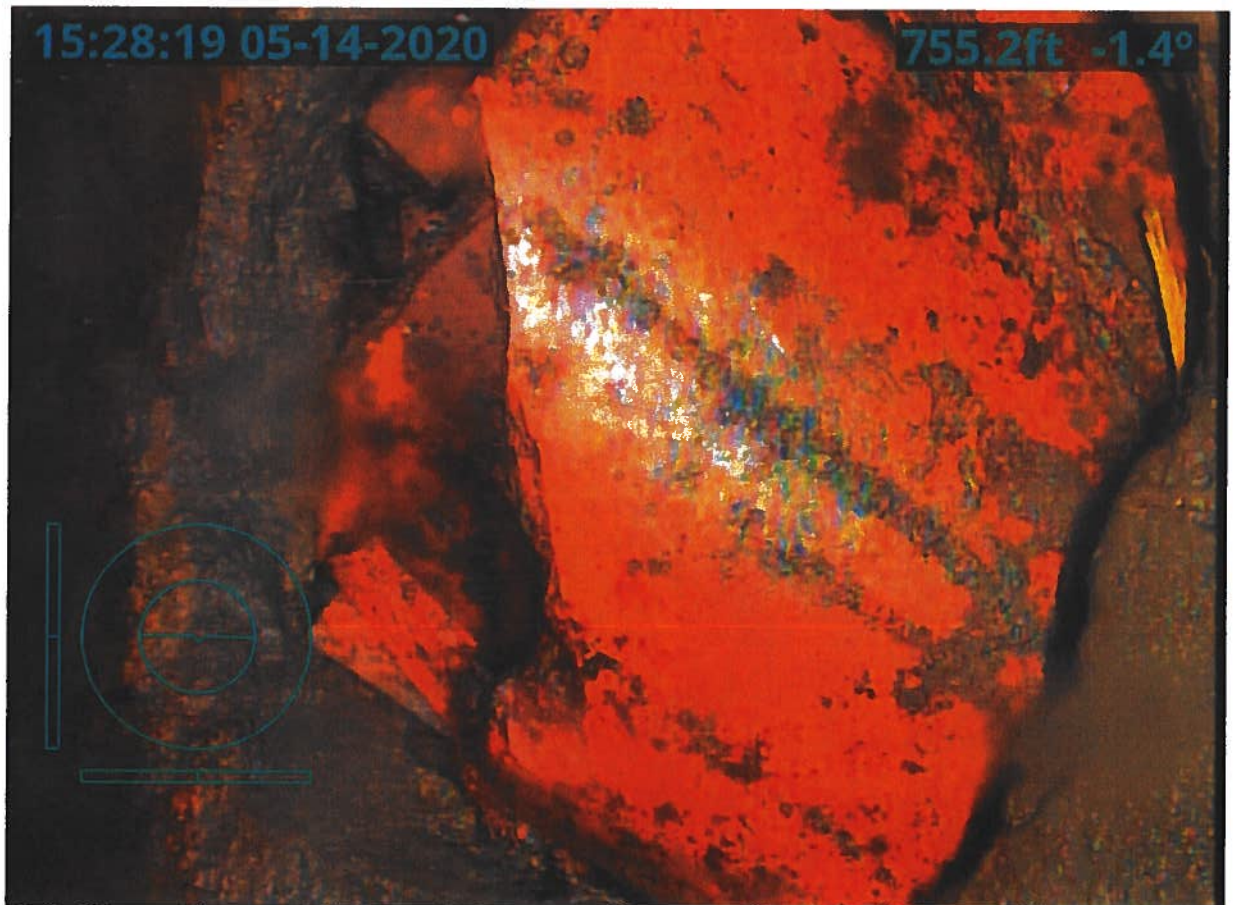
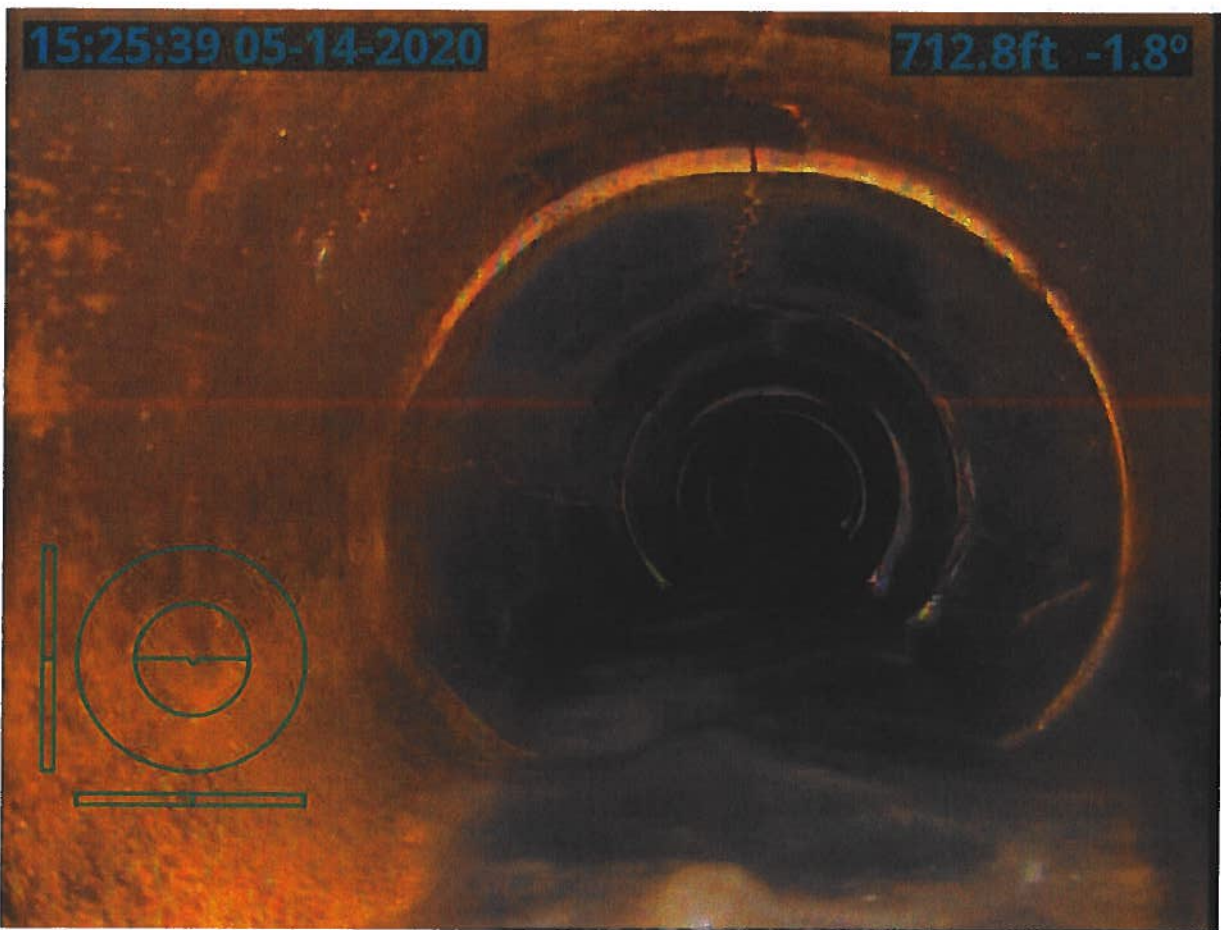
546.9ft -2.8°



15:21:29 05-14-2020

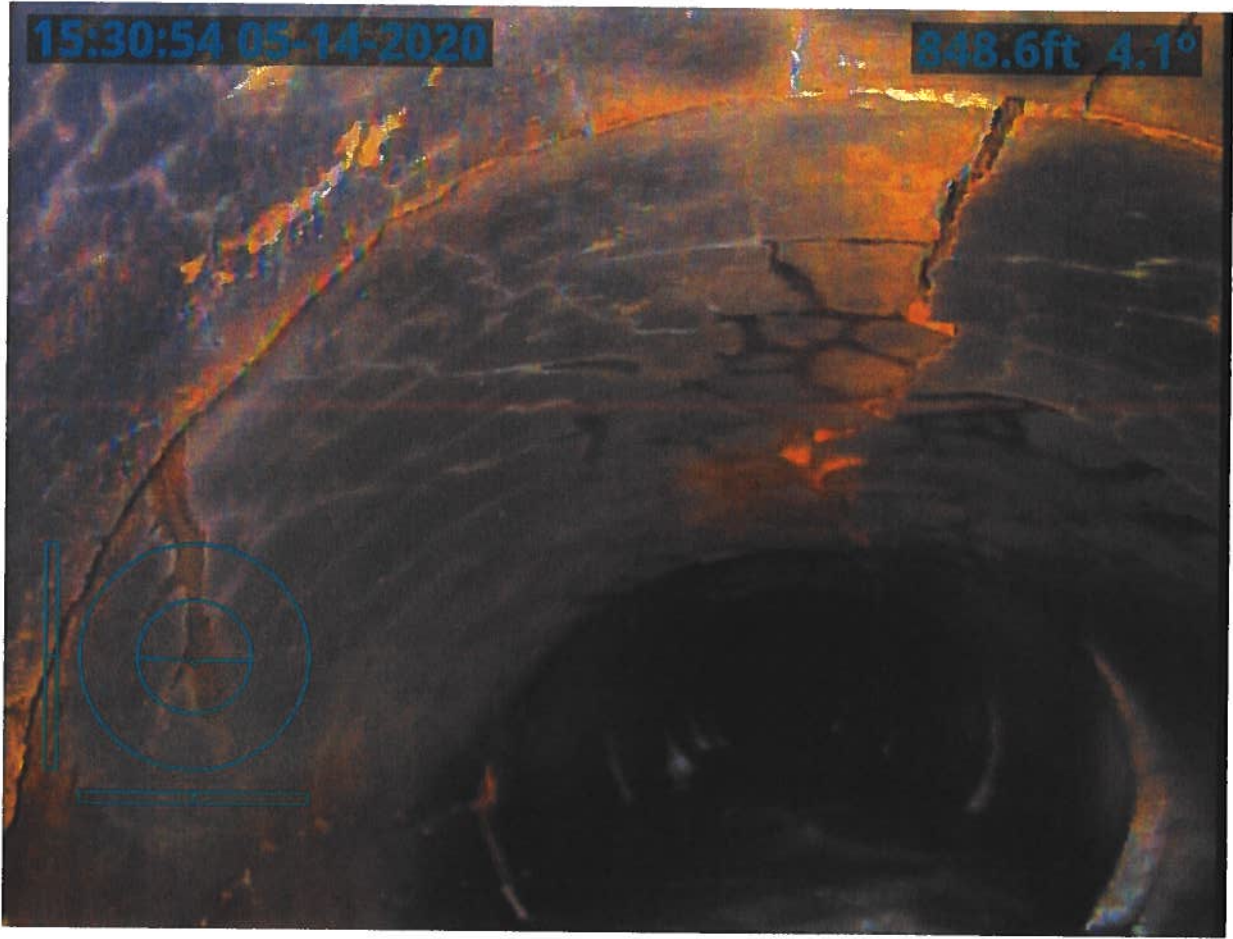
602.6ft -2.9°





15:30:54 05-14-2020

848.6ft 4.1°



1,3603240.750,4962602.710,1176.370,HC GPSMON 8026
 2,3603240.750,4962602.710,1176.370,Autonomous Setup
 3,3618688.957,4946916.051,1169.764,HC GPS 8016
 4,3605705.123,4952677.153,1135.516, TOP 12"VCP JOINT 1.06'TOP TO FL
 5,3606415.768,4950139.889,1135.574,GS TILE BLOWOUT N SIDE
 6,3606436.207,4950151.534,1135.854,GS TILE BLOWOUT N SIDE
 7,3606433.594,4950154.282,1135.676,GS TILE BLOWOUT N SIDE
 8,3606806.866,4950366.902,1140.171,FENCE E-W
 9,3606807.989,4950160.633,1143.206,FENCE E-W
 10,3606808.684,4950069.741,1147.297,FENCE E-W
 11,3606418.172,4950139.776,1130.823, TOP 15" VCP TILE JOINT (1.35'TOPTO FL)
 12,3606416.527,4950138.554,1130.832, TOP 15" TILE (1.35' TOP TO FL
 13,3606433.374,4950151.026,1130.931, TOP 15" TILE (1.30' TOP TO FL
 14,3606431.767,4950149.817,1130.912, TOP 15" TILE (1.35' TOP TO FL
 15,3606430.189,4950148.568,1130.898, TOP 15" TILE (1.33' TOP TO FL
 16,3605706.138,4952688.229,1139.481,GS
 17,3605704.925,4952670.361,1139.347,GS
 18,3605480.270,4952811.838,1148.799,FENCE E-W
 19,3605485.212,4952217.754,1137.030,FENCE E-W
 20,3608115.762,4952199.343,1155.903,MAG NAIL
 21,3605484.284,4952146.915,1142.370,SURVEY MARK NAIL
 22,3606802.079,4952129.144,1147.964,FENCE S&W
 23,3608053.507,4952267.497,1152.132,CPT 34 IR 0.2'D
 24,3607989.169,4950926.173,1140.628, TOP EXISTING 15"CMP
 25,3608049.542,4950961.076,1141.017, TOP 14" VCP (1.17'TOPTOFL)
 26,3608053.288,4950963.091,1140.699, TOP 14" VCP (0.96'TOPTOFL)
 27,3607983.653,4950923.063,1140.661, TOP 14" VCP (1.21'TOPTOFL)
 28,3608080.752,4950995.945,1141.522, TOP EXISTING 15" SW HDPE TILE
 29,3608083.253,4950994.402,1141.500, TOP 6"SW CPP (0.49'TOPTOFL)
 30,3608092.799,4951005.494,1141.648, TOP 15" CMP (1.23' TOP TO FL)
 31,3608077.605,4950993.300,1145.298,GS
 32,3608060.368,4950969.312,1145.175,GS
 33,3608037.548,4950953.803,1145.213,GS
 34,3608015.699,4950941.810,1145.088,GS
 35,3607980.101,4950921.322,1144.873,GS
 36,3608000.481,4950932.767,1140.940, TOP 15" HDPE PERFTILE (0.67'NTOBELL)(1.35'TOPTO FL)
 37,3608084.607,4950949.402,1145.388,GS FIELD/DITCH
 38,3608084.599,4950983.584,1145.143,GS FIELD/DITCH
 39,3608082.212,4951024.307,1146.627,GS FIELD/DITCH
 40,3608100.133,4950999.532,1145.416,FL 4'*2'TALL CONC BOX
 41,3608089.162,4950987.889,1148.373, TOP 6" HICKENBOTTOM INTAKE (6.31' TOP TO FL)
 42,3608017.662,4950942.112,1141.078, TOP 15" HDPE PERF TILE (1.35'TOPTO FL)
 43,3608034.233,4950952.510,1141.216, TOP 15" HDPE PERF TILE (1.35'TOP TO FL)
 44,3608051.197,4950962.357,1141.350, TOP 15" HDPE TILE (1.35'TOPTOFL
 45,3608033.829,4950950.107,1140.548, TOP 6" PERF TILE (0.51'TOPTO FL)
 46,3608034.571,4950947.776,1140.544, TOP 6" PERF TILE (0.51'TOPTO FL)
 47,3608034.608,4950940.382,1140.602, TOP 6" PERF TILE (0.51'TOPTO FL)
 48,3608034.739,4950934.740,1140.530, TOP 6" PERF TILE (0.51'TOPTO FL)

102,3606801.876,4950336.843,1134.500, TOP 15" CLAY 1.38' TOPTOFL
103,3606776.447,4950322.423,1139.240,GS ABOVE TILE
104,3606801.246,4950330.369,1139.443,GS
105,3606785.751,4950322.663,1139.572,GS
106,3606781.230,4950330.843,1139.443,GS
107,3606800.988,4950343.062,1139.717,GS
108,3606806.097,4950348.422,1140.101,FENCE E-W
109,3606806.277,4950329.481,1140.050,FENCE E-W
110,3606812.666,4950342.795,1139.661,GS
111,3606808.337,4950339.736,1138.919,GS
112,3606784.008,4950326.675,1134.306, TOP 15" CLAY 1.31' TOPTOFL
113,3606784.164,4950326.703,1134.338, TOP 15" HDPE PERF TILE
114,3606798.454,4950335.076,1134.431, TOP 15" HDPE PERF TILE
115,3606801.757,4950336.845,1134.463, TOP 15" HDPE PERF TILE
116,3605345.937,4950152.361,1122.926,GS ABOVE TILE
117,3605340.655,4950146.152,1122.854,GS ABOVE TILE
118,3605342.974,4950149.013,1120.006,TILE TOP "CLAY (1.25'TOP TO FL)
119,3605344.620,4950151.047,1120.026,TILE TOP "CLAY (1.22'TOP TO FL)
120,3605385.960,4950177.421,1123.131,GS ABOVE TILE
121,3605379.508,4950173.853,1123.177,GS ABOVE TILE
122,3605414.981,4950167.886,1124.101,GS WATERWAY
123,3605371.837,4950148.276,1123.621,GS WATERWAY
124,3605332.279,4950112.525,1122.863,GS WATERWAY
125,3605309.994,4950133.091,1122.804,GS WATERWAY
126,3605355.127,4950171.596,1123.269,GS WATERWAY
127,3605414.606,4950191.842,1123.890,GS WATERWAY
128,3605452.781,4950199.659,1124.464,GS TILE LOCATE
129,3605507.884,4950208.120,1125.500,GS TILE LOCATE
130,3605566.488,4950211.914,1125.840,GS TILE LOCATE
131,3605624.107,4950214.918,1126.524,GS TILE LOCATE
133,3605683.158,4950217.229,1126.920,GS TILE LOCATE
134,3605750.126,4950216.561,1127.637,GS TILE LOCATE
135,3605805.896,4950206.324,1128.247,GS TILE LOCATE
136,3605869.322,4950185.200,1128.558,GS TILE LOCATE
137,3605907.201,4950164.902,1128.683,GS TILE LOCATE END CAMERA
138,3605951.503,4950135.957,1125.608,TILE TOP "CLAY (1.09'TOP TO FL) REMOVED
139,3605948.015,4950138.425,1125.762,TILE TOP "CLAY (1.21'TOP TO FL) REMOVED
140,3606002.087,4950097.117,1129.897,GS TILE LOCATE
141,3606047.969,4950060.252,1130.485,GS TILE LOCATE
142,3606093.946,4950024.079,1131.195,GS TILE LOCATE
143,3606148.452,4949995.916,1131.594,GS TILE LOCATE
144,3606194.832,4949987.959,1131.959,GS TILE LOCATE
145,3606198.408,4949987.796,1132.012,GS TILE LOCATE END LOCATE
146,3605911.704,4950162.539,1125.405,TILE TOP "CLAY 1.32'TOPTOFL
147,3605913.527,4950161.426,1125.261,TILE TOP "CLAY 1.05'TOPTOFL REMOVED
148,3605905.139,4950166.616,1128.680,GS ABOVE TILE
149,3605914.838,4950160.561,1128.801,GS ABOVE TILE
150,3605945.044,4950140.580,1129.365,GS ABOVE TILE
151,3605953.724,4950134.445,1129.394,GS ABOVE TILE

201,3606210.807,4949998.901,1132.203,GS WATERWAY
202,3606214.261,4949964.616,1132.458,GS WATERWAY
203,3606132.656,4949976.520,1131.497,GS WATERWAY
204,3606052.849,4950031.398,1130.741,GS WATERWAY
205,3605988.156,4950092.948,1129.841,GS WATERWAY
206,3605267.201,4950069.065,1122.129,GS WATERWAY
207,3605228.432,4949964.232,1121.465,GS WATERWAY
208,3605197.938,4949866.193,1120.875,GS WATERWAY
209,3605163.386,4949760.174,1119.578,GS WATERWAY
210,3605125.162,4949640.384,1118.926,GS WATERWAY
211,3605110.716,4949585.173,1118.333,GS WATERWAY
212,3605100.210,4949499.905,1117.402,GS WATERWAY
213,3605122.963,4949510.205,1118.127,GS WATERWAY
214,3605495.092,4949501.521,1129.346,FNL N-S&W
215,3605133.332,4949555.621,1118.404,GS WATERWAY
216,3605178.871,4949717.223,1119.920,GS WATERWAY
217,3605241.192,4949906.375,1121.016,GS WATERWAY
218,3605271.139,4950005.075,1121.944,GS WATERWAY
219,3605312.635,4950088.007,1122.763,GS WATERWAY