CITY OF COLUMBIA

DEPARTMENT OF PROCUREMENT AND CONTRACTS

1800 MAIN STREET, COLUMBIA, SC 29201
OFFICE: 803-545-3470 FAX: 803-758-1013
purchasing@columbiasc.net

January 13, 2021

PROJECT: BID020-20-21-LAG - Lower Saluda River Relief Sewer and Pipe Rehabilitation (SS7428) CDBE

ADDENDUM No. 2

Contractors submitting a bid for the above named project shall take note of the following changes, additions, deletions, clarifications, etc. in the issuance of this addendum, which shall become a part of and have precedence over anything contrarily shown or described in the contract documents. All such shall be taken into consideration and be included in the contractor's bid Proposal.

Acknowledge receipt of this addendum by responding to the eBid system question. This addendum forms a part of the contract documents.

The attached noted items are corrections, additions or deletions to the contract documents, as noted:

1. **Response for Submitted Questions.**
2. **Attachment Appendix E, CCTV Reports.**

Question 1.)

How was the average annual average high water elevation calculated?

Answer: The consultant and City reviewed several decades of river gage level elevations and developed an annual average high level as shown in the following table, for reference only:

Avg. Flood Elevation by Station	
Station Number	Avg. Flood Elevation
0+00 - 27+00	178
27+00 - 63+00	179
63+00 - 99+00	180
99+00 - 126+00	181
126+00 - 153+00	182
153+00 - 198+00	183

Question 2.)

How many times a year will the flood elevation get above 174.00?

Answer: Bidders are directed to agencies, such as USGS, for statistical river level data. One source may be: https://streamstats.usgs.gov/ss/

Question 3.)

Will Flowtite (FRP) be considered an acceptable pipe for this project?

Answer: Yes. Flowtite (FRP) is considered an equal. See modifications to specification section 02624 as noted in this addendum.

Questions 4.)

Please clarify the intended specification for the ductile iron pipe. There are currently conflicting specifications. Section 02615, the engineer's technical specifications calls for 30" and larger diameter to be class 150. The City of Columbia's Engineering regulations, page 17-4 calls for 24"-48" diameter to be class 200.

Answer: Class 150 per Section 02615.

Question 5.)

The manhole rehab specification mentions two different types of MH lining systems: 1.) Cementitious (Calcium aluminate, 1"; Sewpercoat /Quadex Aluminaliner) and 2.) Epoxy Coating. Can the owner confirm that EITHER system is acceptable and their intent is not for a Cementious base coat with an epoxy overlay.

> **Answer: Either system is acceptable. The intent is not for a cementitious base coat with an epoxy overlay.**

Question 6.)

Page 100-C-10. Do you know the approximate elevation of the existing two 36" Pump River Water pipes?

> **Answer: This information was not available. For bidding purposes, assume the pipes have between 3 and 6 feet of cover.**

Question7.)

Page 100-C-10 Do you know what the Existing 36" pump water pipe is? Ductile Iron, Concrete, etc.

> **Answer: This information was not available. For bidding purposes, assume the pipe is ductile iron.**

Question 8.)

Page 100-C-10 Due to the depth of the new gravity sewer pipe and the location of the two 36" Pump River piping, would you consider lengthening the bore to accommodate the depth.

> **Answer: Reference Section 02650 Paragraph 1.05, "The Contractor may extend the casing length if approved by the Engineer at no additional cost to the Owner."**

Question 9.)

In the Pipe Bursting sections the existing gravity sewer does not have much cover over it. With the up sizing from 27" to 36" pipe do you not expect some ground heave? If it occurs how will any repairs be paid for?

Answer: Damaged concrete path will be replaced and paid under bid item A-11.

Question 10.)

There doesn't seem to be a bid item for any possible point repairs on the existing Gravity Sewer in the CIPP sections. Without having any Preconstruction pipe video we cannot anticipate how many point repairs if any will have to be done. Would you consider adding a line Item for point repairs.

Answer: Line segments scheduled for CIPP were inspected in 2015 and 2016 and defects requiring point repairs not observed. For reference only, Appendix E has been prepared with the CCTV reports for both the CIPP segments and lines scheduled for replacement via pipe bursting.

Question 11.)

Please provide a detail for the construction of temporary trails as indicated on Sheets 52-55.

Answer: There is no typical detail. The intent is for the contractor to coordinate with ICRC and establish a 4-foot wide temporary trail, removing ground cover and small vegetation (briars, small tree limbs, etc.), to provide reasonable access for a pedestrian or cyclist. Additional requirements requested by ICRC or the Owner (i.e. concrete or asphalt paths) will be negotiated via change order.

Question 12.)

Due to the upsizing in the Pipe Bursting section, rock and boulders may be encountered that would need to be removed. How will that be paid for and dealt with?

Answer: Reference bid item A-8, Rock and Boulder Excavation. Also reference the geotechnical report in Appendix A, specifically bores B-19 through B-21.

Question 13.)

Please confirm that Bore and Jacking is a guaranteed regardless of Material encountered.

Answer: Correct. Reference Section 02450 Paragraphs 3.06 and 3.08.

Question 14.)

Section 01014-2 1.02 9. The collection of core samples. Please provide more detail to include frequency of samples, etc.

Answer: At a minimum, provide (1) 4-inch coupon per line segment. Contractor may take additional samples if necessary.

Question 15.)

Would you consider adding an additional 180 days to the contract time. 415 days to substantial completion is very tight.

Answer: The Project Completion Time will be increased by an additional 65 days. Therefore, Substantial Completion is due within 520 calendar days and Final Completion within 580 calendar days. See modifications to specification section 01170 as noted in this addendum.

Question 16.)

Section 01014-3 1.03 C. There are several boat landings at Saluda Shoals Park. Which landing is the restricted work area referring, the one below station 169+00 or the one near 91+50?

Answer: 91+50

Question 17.)

Can 8 foot side walk detail be provided?

Answer: Reference Detail 19/000-C-004

Question 18.)

Section 02763-1 Manhole Rehab 1.01 D. References that point repairs will be paid for per the bid schedule. There is no bid item for point repairs. Will you add to the bid schedule?

Answer: No. Point repairs are ancillary and should be included in other manhole rehabilitation items.

Question 19.)

Is there a plan holders list available for this project?

Answer: The City of Columbia does not provide a plan holders listing.

Question 20.)

Will the Owner please confirm whether the HDPE for the Pipe Bursting scope should be "IPS" or "DIPS" pipe?

Answer: DIPS; DR17, ID ~ 33.524"

Question 21.)

Section 02767 (Sanitary Sewer Flow Control) Part 2.01 K states "Include 100% mechanical redundancy installed online." Please clarify. For example, if the designed pump system requires 2 units operating in parallel to meet the peak required flow, does a 3rd like unit installed online meet this specification for redundancy? Or, in this example would an additional 2 like units be installed online for a total of 4?

Answer: Revise the Paragraph to state, "Include mechanical redundancy installed online with a float or ultrasonic type system to switch to the standby system automatically if a primary system fails. Mechanical redundancy 100% independent of the primary system and shall account for 50% of the design flow rate.

Question 22.)

Section 02767 (Sanitary Sewer Flow Control) Part 3.01 C states "For complete bypass required for new construction and pipe rehabilitation, the bypass system shall be a sufficient capacity to handle full pipe capacity for the pipeline section being bypassed times 1.25". Can the engineer please quantify flow that meets this requirement for the segments of bypass called out on Drawings 300-C-01, 02, & 03? Otherwise, can you propose how this capacity can be quantified without knowing the existing slope and pipe composition of the pipeline sections to be bypassed?

Answer: The Contractor is ultimately responsible for the design of the bypass system. Information on the flows from the minor 8" sewer lines into the interceptor sewer is not available. Rim and invert information for the existing system is shown on 000-C-11. Please add the following manhole information to the tables:

MH18992: Rim =180.48, IE = 172.54
MH18679: Rim = 174.67, IE = 173.94
MH18704: Rim = 179.00, IE 173.93
MH18776: Rim = 186.79, IE = 177.19
MH19032: Rim = 182.77, IE = 177.69

The Owner conducted hydraulic modeling of the system in 2018 and the combined pipe capacities for the following segments are estimated.

Saluda River PS to MH-A-10: 10.1 MGD
MH-A-11 to MH-A-43: 6.0 MGD
MH-A-44 to MH-A-76: 5.1 MGD

This information is for reference only and does not alleviate the Contractor from the requirements of Section 02767.

Question 23.)

The depth, diameter, bursting method, & existing pipe material could cause a change to grade when bursting with new HDPE. Will the Owner provide allowable tolerance for any changes to grade?

Answer: Because the grades on this alignment are nearly flat there is very little room for any tolerance in either vertical direction.

Question 24.)

Does the Owner have an geotechnical information for the areas proposed for bursting to include any evidence of rock?

Answer: See Appendix A of the Specifications.

Question 25.)

Are there any current videos of existing line(s) proposed for pipe bursting replacement?

Answer: See Q10 above.

Question 26.)

In the event a pipe burst fails will the Contractor be allowed to excavate & recover the bursting head/expander in area proposed for bursting?

Answer: Yes.

Question 27.)

Significant upsizing like that proposed for the bursting scope could result in ground heaving. If that should occur, will the Owner please confirm how the Contractor should repair said heaving? How will the Contractor be compensated for these repairs, especially between MH A-49 and A-50?

Answer: See Q9.

Question 28.)

Will the Owner please confirm what type of couplings are approved for use to tie in new 36" HDPE at the manholes?

Answer: Use a flexible manhole/pipe connector as specified in Section 02605 Paragraph 2.08.

Question 29.)

We have found the coating requirements for the exterior of the new manholes as well as the rehab MH coating, are there any requirements for the interior of the new manholes or any corrosion inhibiting admixtures required?

Answer: No, unless otherwise specified on the drawings.

Question 30.)

Can we propose alternate phasing of the CIPP and Pipe Bursting if awarded the project?

Answer: Yes.

Question 31.)

Please confirm where and when the "Subsequent Backfill" can be native or must be imported select granular materials. Details 7,8, and 9 on page 000-C-03 mention both.

Answer: Refer to Section 02200, specifically Paragraphs 2.01 and 3.05, and Table A.

Question 32.)

Are there any contractual requirements for staging materials, equipment, or bypass pumps above the average high water mark?

Answer: No. However, please reference Part 15, Paragraphs 15.53 and 15.56 of the City's Standard Specifications for additional information regarding protection of work and weather emergencies.

Question 33.)

Will the Owner confirm all the existing pipe proposed to be burst is 27" diameter RCP?

Answer: It is based on the information available to the Owner, to include the CCTV reports provided in Appendix E. See Section 01014-2 1.02 9 and Q14 above.

Question 34.)

Due to the end of the year holidays is it possible to extend the deadline for questions and possibly the bid date as well?

Answer: No.

Question 35.)

Can the owner make the pre-bid meeting attendance list available?

Answer: Please see Bid Attachments.

Question 36.)

Can Flowtite Fiberglass Pipe be listed as an approved supplier along with the currently specified Hobas fiberglass material? The Flowtite material meets all the AWWA standards. The difference between what is specified and our product is that your current product specified is manufactured via a centrifugally cast method, while our Flowtite product is manufactured via a filament wound process. We have a completed RFI prepared and can send if needed.

Answer: See Q3

Question 37.)

Section 02767 (Sanitary Sewer Flow Control) Part 3.04 E states "Keep an HDPE fusion machine on site for the duration of bypass pumping to facilitate immediate repairs to hard piping." Can you confirm this requirement? Would maintaining HDPE repair clamps on site be an acceptable substitute?

Answer: Maintaining HDPE repair clamps on site is an acceptable substitute, provided the Contractor can demonstrate the ability to mobilize a fusion machine to the site within 24 hours.

MODIFY THE CONTRACT DOCUMENTS AS FOLLOWS:

Section 01014

1.02 9. **ADD the following to the last sentence, "At a minimum, the Contractor shall provide (1) 4-inch coupon per line segment. Contractor may take additional samples if necessary."**

1.03.C **REVISE paragraph to, "Construction between the boat landing at Saluda Shoals Park near Station 91+50 and Bush River Road must only occur between the months of January to October as to not interfere with the annual holiday lights event in the park."**

Section 01170

1.04.A **REVISE the paragraph to the following, "The Contractor shall substantially complete the project within 520 consecutive calendar days and fully complete the project within 580 consecutive calendar days from the date of commencement."**

Section 02625,

ADD the following:

2.02.C **Pipe shall be ductile iron pipe size (DIPS), DR17, with an internal diameter of approximately 33.524 inches.**

Section 02767

2.01.K **REPLACE the entire paragraph with, ""Include mechanical redundancy installed online with a float or ultrasonic type system to switch to the standby system automatically if a primary system fails. Mechanical redundancy 100% of independent of the primary system and shall account for 50% of the design flow rate."**

3.04.E **ADD the following sentence, "Maintaining HDPE repair clamps on site is an acceptable substitute, provided the Contractor can demonstrate the ability to mobilize a fusion machine to the site within 24 hours."**

Section 02610.

ADD the following:

3.03.G.5. **Warranty Phase Services: In addition to the initial mandrel testing required prior to final acceptance testing of the line segment, a second mandrel testing is required between 9 and 12 months following substantial completion for all flexible and semi-rigid pipe.**

Section 02624:

2.01.A. **REVISE the last sentence to: "The pipe shall be manufactured by Hobas Pipe USA, Flowtite, or equal, and shall be domestically manufactured in the United States of America."**

2.01.E. **ADD "Pipe joints shall be manufactured to withstand an internal pressure of 50 psi."**

Appendix:

ADD Appendix E, CCTV Reports. These are for reference only.

Drawing 000-C-11. ADD the following manhole information to the tables:
MH18992: Rim =180.48, IE = 172.54
MH18679: Rim = 174.67, IE = 173.94
MH18704: Rim = 179.00, IE 173.93
MH18776: Rim = 186.79, IE = 177.19
MH19032: Rim = 182.77, IE = 177.69

PLEASE SEE APPENDIX E, CCTV REPORTS

End of Addendum No. 2

Appendix E: CCTV Reports (CIPP & Pipe Burst Lines)

16062MH_16063MH_20150520
16070MH_16071MH_20160416
16082MH_16083MH_20160415
17964MH_16067MH_20150519
18691MH_18690MH_20150515
18969MH_18967MH_20150514
18986MH_18691MH_20150515

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HYDROMAX USA

Project Information

Surveyor Name	HYM_JAK	**Certificate Number**	U-206-2847
Owner	City of Columbia	**Customer**	City of Columbia
Drainage Area	SR14	**PO Number**	SS7278
Pipe Segment Reference	16062MH_16063MH	**Date**	5/20/2015 1:10:00 PM
Street	4500 Block Saint Andrews Rd.	**City**	Columbia, SC
Comments			

Manhole

Upstream MH	16062MH	**Rim to Invert (U)**	17.6
Grade to Invert (U)	16	**Rim to Grade (U)**	1.6
Downstream MH	16063MH	**Rim to Invert (D)**	17.8
Grade to Invert (D)	14.4	**Rim to Grade (D)**	3.4
Sewer Use	Sanitary	**Direction of Survey**	Downstream

Pipe

Height (Diameter)	30	**Width**	30
Shape	Circular	**Material**	Reinforced Concrete Pipe
Lining Method		**Pipe Joint Length**	13
Total Length	429.4	**Length Surveyed**	429.4
Year Laid		**Year Renewed**	

Misc

Flow Control	Not Controlled	**Media Label**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Easement/Right of Way
Additional Info	CCTV / easement	**Location Details**	Woods next to river

Custom

Number of Taps	0	**Number of Roots**	0
Num Cracks / Fractures	0	**Number of Broken / Holes / Collapse**	0
Number of Deposits	16	**PACP Quick Structure**	HYM
PACP Quick Maintenance		**PACP Quick Overall**	20171215
OM Grade		**Overall Grade**	

Pacp 6

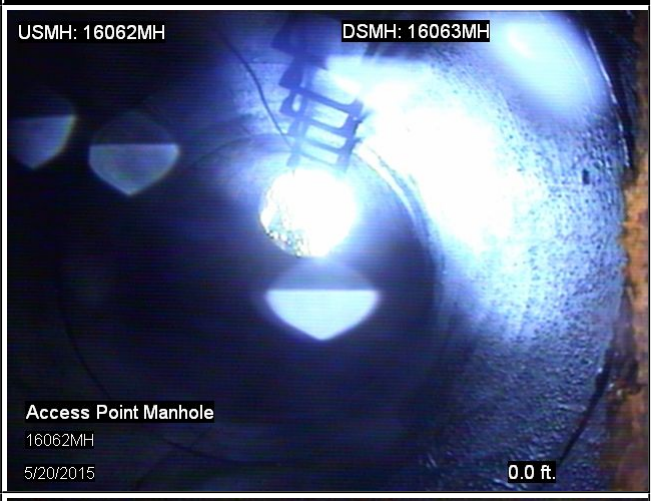
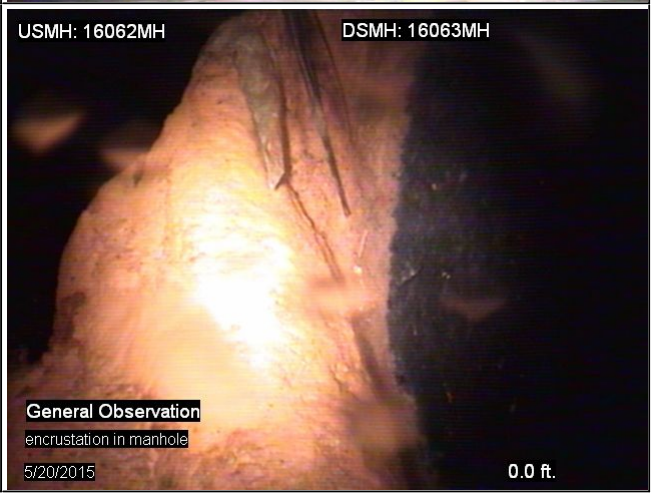
Reverse Setup ID	0	**Sheet (Group) Number**	1
Imperial Units (US)	True	**Pressure Value**	0
Work Order		**Project**	15-30 Inch Gravity Sewer Assessment
		Completed	

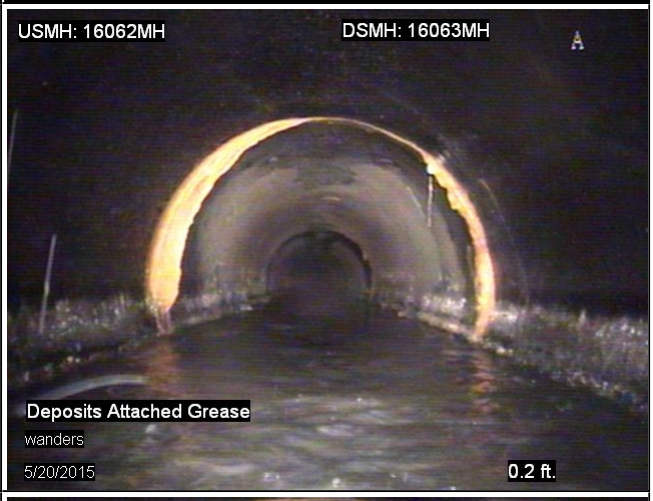
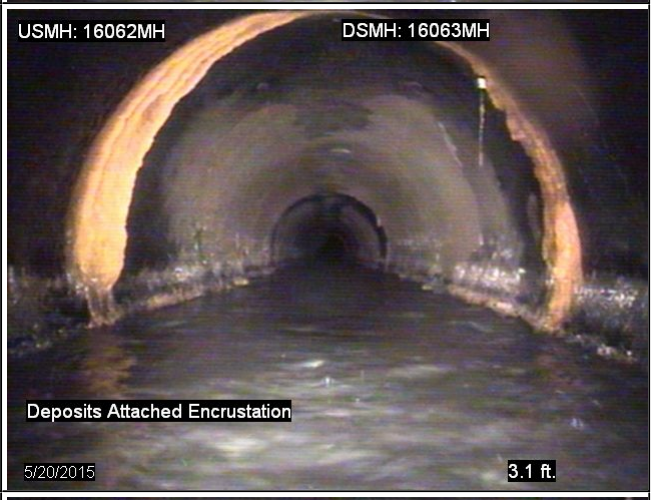
Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/20/2015 1:10:00 PM

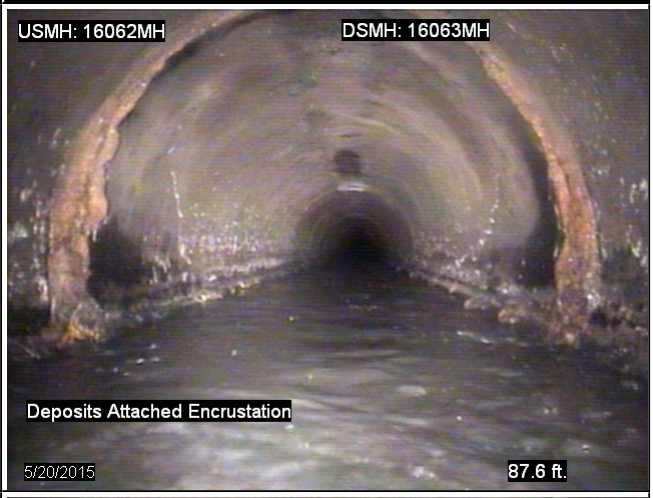
Street: 4500 Block Saint Andrews Rd.
Length Surveyed: 429.4
Pacp Quick Overall Rating: 4132
Height (Diameter): 30
Street: 4500 Block Saint Andrews Rd.

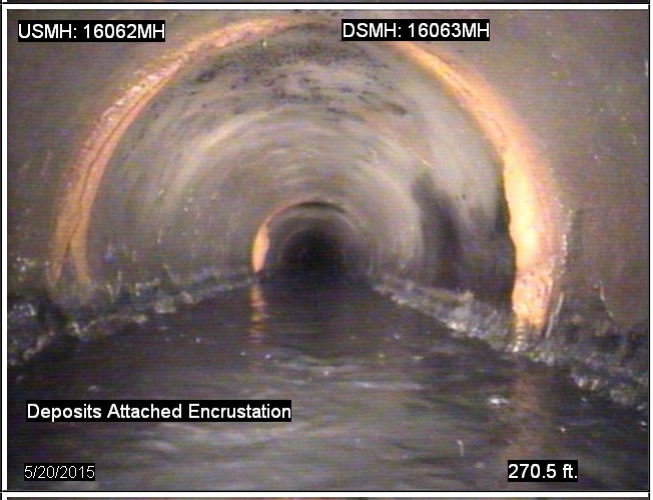
Pipe Segment Reference: 16062MH_16063MH
Upstream MH: 16062MH
Downstream MH: 16063MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Distance	Fault Observation	Time	Picture
0.0	**Manhole** **Severity: None** **Percent: 0** **Attention Required** **Remarks: 16062MH**	7	
0.0	**Water Level** **Severity: None** **Percent: 20** **Attention Required**	37	
0.0	**General Observation** **Severity: None** **Percent: 0** **Attention Required** **Remarks: encrustation in manhole**	01:06	

Distance	Fault Observation	Time	Picture
0.2	Deposits Attached Grease Position: 8 To 4 Severity: None Cont Defect: S01 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	04:33	
3.1	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 10 Joint Attention Required Maint Weight: 2	05:43	
4.9	Surface Spalling Other Position: 8 To 4 Severity: None Cont Defect: S02 Percent: 0 Attention Required Remarks: wanders Struct Weight: 2	06:49	

Distance	Fault Observation	Time	Picture
51.3	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	12:04	
53.1	Deposits Settled Other Position: 6 Severity: None Cont Defect: S03 Percent: 5 Attention Required Remarks: under water Maint Weight: 2	13:16	
63.7	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	15:28	

Distance	Fault Observation	Time	Picture
87.6	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	17:40	
148.5	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	21:18	
172.9	Deposits Attached Encrustation Position: 9 To 4 Severity: None Percent: 10 Joint Attention Required Maint Weight: 2	23:32	

Distance	Fault Observation	Time	Picture
245.7	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 20 Joint Attention Required Maint Weight: 3	27:35	
270.5	Deposits Attached Encrustation Position: 9 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	29:44	
282.2	Deposits Attached Encrustation Position: 8 To 12 Severity: None Percent: 10 Joint Attention Required Maint Weight: 2	31:15	

Distance	Fault Observation	Time	Picture
294.7	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	32:41	
331.0	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 15 Joint Attention Required Maint Weight: 3	36:18	
331.0	Infil Runner Position: 9 Severity: None Percent: 0 Joint Attention Required Maint Weight: 4	36:41	

Distance	Fault Observation	Time	Picture
379.5	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	40:42	
427.2	Deposits Settled Other Position: 6 Severity: None Cont Defect: F03 Percent: 5 Attention Required Remarks: under water Maint Weight: 2	42:55	
427.2	Surface Spalling Other Position: 8 To 4 Severity: None Cont Defect: F02 Percent: 0 Attention Required Remarks: wanders Struct Weight: 2	43:11	

Distance	Fault Observation	Time	Picture
427.2	Deposits Attached Grease Position: 8 To 4 Severity: None Cont Defect: F01 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	43:24	
429.4	General Observation Severity: None Percent: 0 Attention Required Remarks: encrustation in manhole	44:13	
429.4	Manhole Severity: None Percent: 0 Attention Required Remarks: 16063MH	44:43	

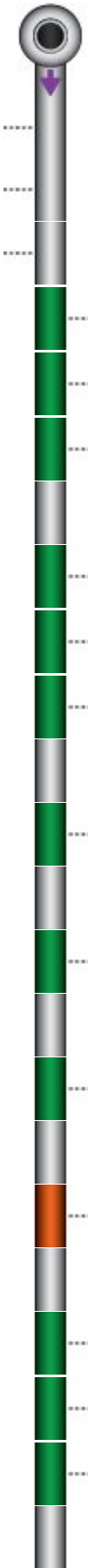
Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/20/2015 1:10:00 PM

Street: 4500 Block Saint Andrews Rd.
Length Surveyed: 429.4
Pacp Quick Overall Rating: 4132
Height (Diameter): 30
Street: 4500 Block Saint Andrews Rd.

Pipe Segment Reference: 16062MH_16063MH
Upstream MH: 16062MH
Downstream MH: 16063MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe



ID Number: 16062MH

(0.0) AMH - Manhole Remark: 16062MH

(0.0) MWL - Water Level

(0.0) MGO - General Observation Remark: encrustation in manhole

(0.2) DAGS - Deposits Attached Grease - Position: 8 To 4 - Cont Def: S01 Remark: wanders

(3.1) DAE - Deposits Attached Encrustation - Position: 8 To 4

(4.9) SSSZ - Surface Spalling Other - Position: 8 To 4 - Cont Def: S02 Remark: wanders

(51.3) DAE - Deposits Attached Encrustation - Position: 8 To 4

(53.1) DSZ - Deposits Settled Other - Position: 6 - Cont Def: S03 Remark: under water

(63.7) DAE - Deposits Attached Encrustation - Position: 8 To 4

(87.6) DAE - Deposits Attached Encrustation - Position: 8 To 4

(148.5) DAE - Deposits Attached Encrustation - Position: 8 To 4

(172.9) DAE - Deposits Attached Encrustation - Position: 9 To 4

(245.7) DAE - Deposits Attached Encrustation - Position: 8 To 4

(270.5) DAE - Deposits Attached Encrustation - Position: 9 To 4

(282.2) DAE - Deposits Attached Encrustation - Position: 8 To 12

(294.7) DAE - Deposits Attached Encrustation - Position: 8 To 4

(331.0) DAE - Deposits Attached Encrustation - Position: 8 To 4

(331.0) IR - Infil Runner - Position: 9

(379.5) DAE - Deposits Attached Encrustation - Position: 8 To 4

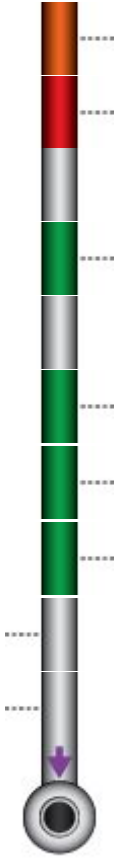
(427.2) DSZ - Deposits Settled Other - Position: 6 - Cont Def: F03 Remark: under water

(427.2) SSSZ - Surface Spalling Other - Position: 8 To 4 - Cont Def: F02 Remark: wanders

(427.2) DAGS - Deposits Attached Grease - Position: 8 To 4 - Cont Def: F01 Remark: wanders

(429.4) MGO - General Observation Remark: encrustation in manhole

(429.4) AMH - Manhole Remark: 16063MH



Total Distance: 429.4

ID Number: 16063MH

Nassco C.C.T.V. Defect Code Information

Session Information			
Surveyors Name	HYM_JAK	**Certificate Number**	U-206-2847
System Owner	City of Columbia	**Survey Customer**	City of Columbia
Drainage Area	SR14		
P/O Number	SS7278	**Pipeline Segment Ref**	16062MH_16063MH
Date	5/20/2015	**Time**	13:10
Location	4500 Block Saint Andrews Rd.		
Locality	Columbia, SC		
Further Location Details: Woods next to river			
Manhole Information			
Upstream Manhole Number: 16062MH			
Rim to Invert	17.6	**Grade to Invert**	16
Rim to Grade	1.6		
Downstream Manhole Number: 16063MH			
Rim to Invert	17.8	**Grade to Invert**	14.4
Rim to Grade	3.4		
Sewer			
Use of Sewer	Sanitary	**Direction**	Downstream
Flow Control	Not Controlled	**Height**	30
Width	30	**Shape**	Circular
Material	Reinforced Concrete Pipe	**Lining Method**	
Pipe Joint Length	13	**Total Length**	429.4
Length Surveyed	429.4	**Year Laid**	
Year Rehabilitated		**Tape/Media Number**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Easement/Right of Way
Additional Information	CCTV / easement		

Nassco C.C.T.V. Defect Code Information

Grade	Structural	O&M	Overall
5	0	0	0
4	0	4	4
3	0	6	6
2	2	24	26
1	0	0	0
Overall	2	34	36
Number of Defects	1	15	16
Pipe Rating	2100	4132	4132
Pipe Ratings Index	2	2	2

Nassco C.C.T.V. Defect Code Information

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	7	AMH - Manhole				0			
		16062MH							
0	37	MWL - Water Level				20			
0	66	MGO - General Observation				0			
		encrustation in manhole							
0.2	273	DAGS - Deposits Attached Grease	S01			5		8	4
		wanders							
3.1	343	DAE - Deposits Attached Encrustation				10	X	8	4
4.9	409	SSSZ - Surface Spalling Other	S02			0		8	4
		wanders							
51.3	724	DAE - Deposits Attached Encrustation				5	X	8	4
53.1	796	DSZ - Deposits Settled Other	S03			5		6	
		under water							
63.7	928	DAE - Deposits Attached Encrustation				5	X	8	4
87.6	1060	DAE - Deposits Attached Encrustation				5	X	8	4
148.5	1278	DAE - Deposits Attached Encrustation				5	X	8	4
172.9	1412	DAE - Deposits Attached Encrustation				10	X	9	4
245.7	1655	DAE - Deposits Attached Encrustation				20	X	8	4
270.5	1784	DAE - Deposits Attached Encrustation				5	X	9	4
282.2	1875	DAE - Deposits Attached Encrustation				10	X	8	12
294.7	1961	DAE - Deposits Attached Encrustation				5	X	8	4
331	2178	DAE - Deposits Attached Encrustation				15	X	8	4
331	2201	IR - Infil Runner				0	X	9	
379.5	2442	DAE - Deposits Attached Encrustation				5	X	8	4
427.2	2575	DSZ - Deposits Settled Other	F03			5		6	
		under water							
427.2	2591	SSSZ - Surface Spalling Other	F02			0		8	4
		wanders							

427.2	2604	DAGS - Deposits Attached Grease	F01		5		8	4
		wanders						
429.4	2653	MGO - General Observation			0			
		encrustation in manhole						
429.4	2683	AMH - Manhole			0			
		16063MH						

Videos Created for Session 15-30 Inch Gravity Sewer Assessment

16062MH_16063MH_20150520.mpg Size: 578 MB

Additional Reports for Session 15-30 Inch Gravity Sewer Assessment

Created with the  report generator

Profile/Photo Observation Report

Date:	**04/16/2016**	Weather:	**Dry**	Coding:	**PACP 4.2**
Pipe Length (ft):	**170.9**	Owner:	**City of Columbia**	Pre Clean:	**No Pre-Cleaning**
P.O.#:	**SJ501390A**	Surveyor:	**RZR_JG**	PSR:	**16070MH_16071MH**
Customer:	**City of Columbia**	Clean Date:		Shape:	**C**

Street:	**Off Bronte Road**	Flow Control:	**Not Controlled**
City:	**Columbia, SC**	Year Renewed:	
Location:	**Easement/Right of Way**	Tape/Media #:	**The Final 90**
Purpose:	**Not Known**	Dia/Height:	**36"**
Use:	**Sanitary**	Material:	**RCP**
Drain Area:	**SR14**	Lining:	
Category:	**NA**		
Comment:	**CCTV**		
Location Details:		Direction of Survey:	**Upstream**

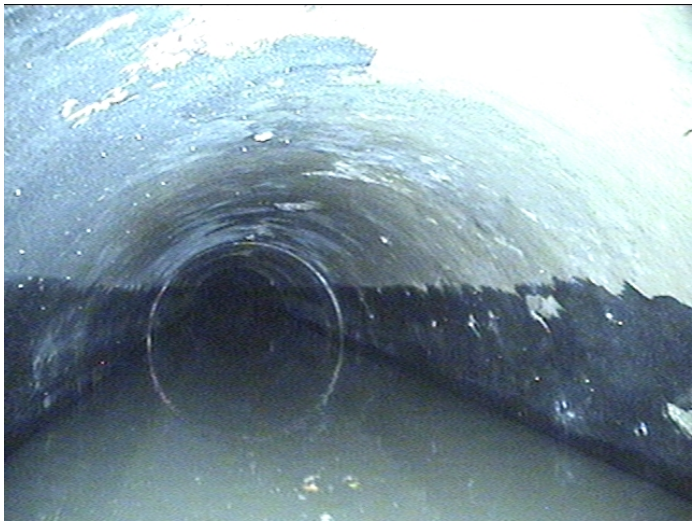
US MH: **16070MH** DS MH: **16071MH** Total Length Surveyed (ft): **158.7**

O&M Index:	**3.00**	O&M Quick:	**3B00**	O&M Rating:	**54**
Structural Index:	**2.12**	Structural Quick:	**342D**	Structural Rating:	**70**
Overall Index:	**2.43**	Overall Quick:	**3C2D**	Overall Rating:	**124**

	Position	Code	Observation	Video (sec)	Grade
16071MH					
	.0	AMH	Manhole	20	NA
	.0	MWL	Water Level	40	NA
	.0	DAGS(S02)	Deposits Attached Grease	45	M 3
	.0	SSS(S01)	Surface Spalling	50	S 2
	5.5	DAE	Deposits Attached Encrustation	136	M 3
	5.5	ID	Infil Dripper	158	M 3
	26.2	CL(S03)	Crack Longitudinal	254	S 2
	36.1	CL(F03)	Crack Longitudinal	294	S 2
	37.7	DAE	Deposits Attached Encrustation	319	M 3
	73.5	DAGS(F02)	Deposits Attached Grease	463	M 3
	120.8	SAV	Surface Aggregate Visible	627	S 3
	137.3	SSS(F01)	Surface Spalling	700	S 2
	137.7	SAV(S04)	Surface Aggregate Visible	701	S 3
	153.3	SAV(F04)	Surface Aggregate Visible	748	S 3
	158.7	AMH	Manhole	872	NA
16070MH					

Code: **AMH**
Description: **Manhole**

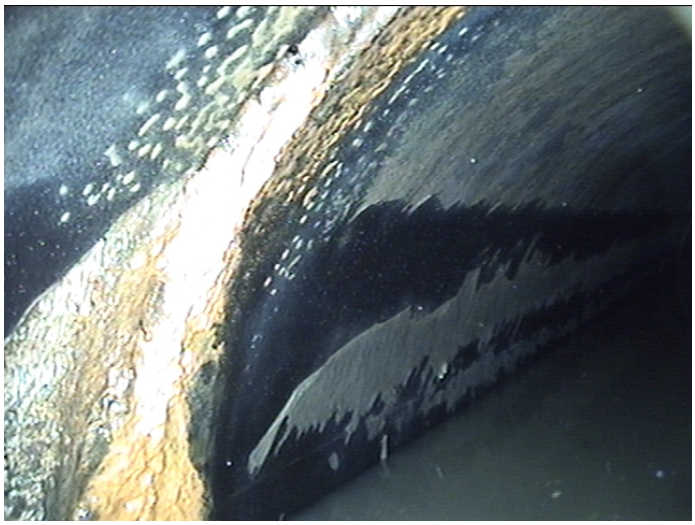
Distance (ft): **.0**
Structural Grade: **0**
O&M Grade: **0**
Clock Start/From:
Clock To:
1st Value:
2nd Value:
Value Percent:
Continuous Index:
Within 8" of Joint: **NO**
Remarks: **16071MH**



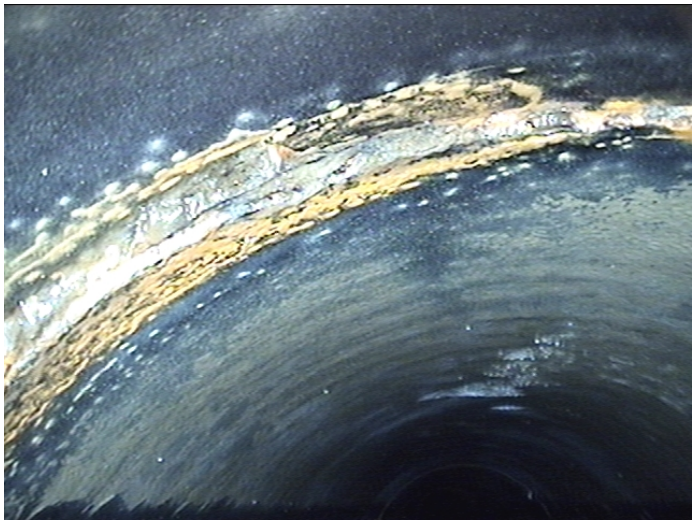
Code:	**MWL**
Description:	**Water Level**
Distance (ft):	**.0**
Structural Grade:	**0**
O&M Grade:	**0**
Clock Start/From:	
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	**25**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**DAGS**
Description:	**Deposits Attached Grease**
Distance (ft):	**.0**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**9**
Clock To:	**3**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	**S02**
Within 8" of Joint:	**YES**
Remarks:	**grease film**

Code:	**SSS**
Description:	**Surface Spalling**
Distance (ft):	**.0**
Structural Grade:	**2**
O&M Grade:	**0**
Clock Start/From:	**10**
Clock To:	**2**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**S01**
Within 8" of Joint:	**NO**
Remarks:	

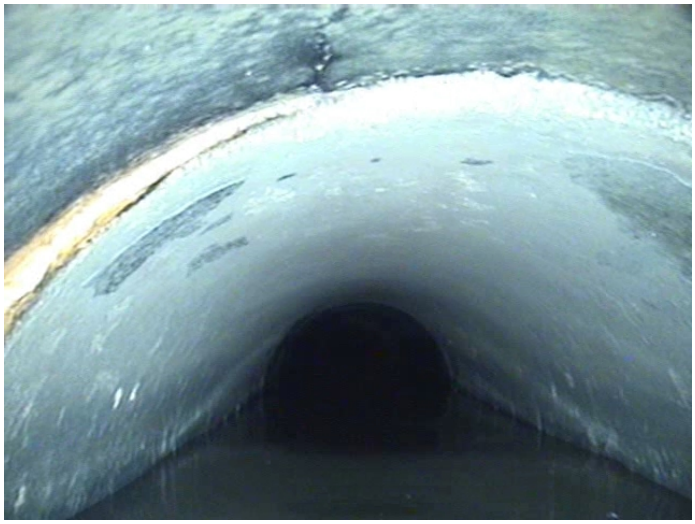


Code:	**DAE**
Description:	**Deposits Attached Encrustation**
Distance (ft):	**5.5**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**9**
Clock To:	**11**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**YES**
Remarks:	

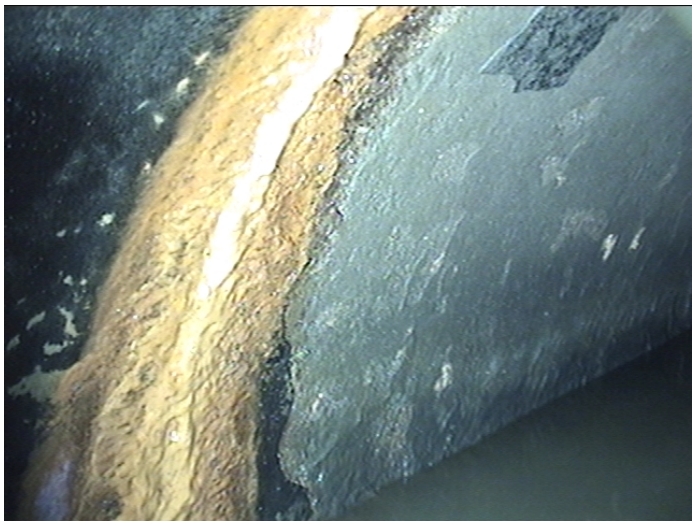


Code:	**ID**
Description:	**Infil Dripper**
Distance (ft):	**5.5**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**11**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	
Within 8" of Joint:	**YES**
Remarks:	

Code:	**CL**
Description:	**Crack Longitudinal**
Distance (ft):	**26.2**
Structural Grade:	**2**
O&M Grade:	**0**
Clock Start/From:	**11**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**S03**
Within 8" of Joint:	**YES**
Remarks:	



Code:	**CL**
Description:	**Crack Longitudinal**
Distance (ft):	**36.1**
Structural Grade:	**2**
O&M Grade:	**0**
Clock Start/From:	**11**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**F03**
Within 8" of Joint:	**YES**
Remarks:	



Code:	**DAE**
Description:	**Deposits Attached Encrustation**
Distance (ft):	**37.7**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**9**
Clock To:	**12**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**YES**
Remarks:	

Code:	**DAGS**
Description:	**Deposits Attached Grease**
Distance (ft):	**73.5**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**9**
Clock To:	**3**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	**F02**
Within 8" of Joint:	**YES**
Remarks:	**grease film**

Code:	**SAV**
Description:	**Surface Aggregate Visible**
Distance (ft):	**120.8**
Structural Grade:	**3**
O&M Grade:	**0**
Clock Start/From:	**9**
Clock To:	**3**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	
Within 8" of Joint:	**YES**
Remarks:	

Code:	**SSS**
Description:	**Surface Spalling**
Distance (ft):	**137.3**
Structural Grade:	**2**
O&M Grade:	**0**
Clock Start/From:	**10**
Clock To:	**2**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**F01**
Within 8" of Joint:	**NO**
Remarks:	

Code:	**SAV**
Description:	**Surface Aggregate Visible**
Distance (ft):	**137.7**
Structural Grade:	**3**
O&M Grade:	**0**
Clock Start/From:	**8**
Clock To:	**4**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**S04**
Within 8" of Joint:	**YES**
Remarks:	

Code:	**SAV**
Description:	**Surface Aggregate Visible**
Distance (ft):	**153.3**
Structural Grade:	**3**
O&M Grade:	**0**
Clock Start/From:	**8**
Clock To:	**4**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**F04**
Within 8" of Joint:	**YES**
Remarks:	

Code:	**AMH**
Description:	**Manhole**
Distance (ft):	**158.7**
Structural Grade:	**0**
O&M Grade:	**0**
Clock Start/From:	
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	**16070MH**

Profile/Photo Observation Report

Date:	**04/15/2016**	Weather:	**Dry**	Coding:	**PACP 4.2**
Pipe Length (ft):	**484.7**	Owner:	**City of Columbia**	Pre Clean:	**No Pre-Cleaning**
P.O.#:	**SJ501390A**	Surveyor:	**RZR_JG**	PSR:	**16082MH_16083MH**
Customer:	**City of Columbia**	Clean Date:		Shape:	**C**

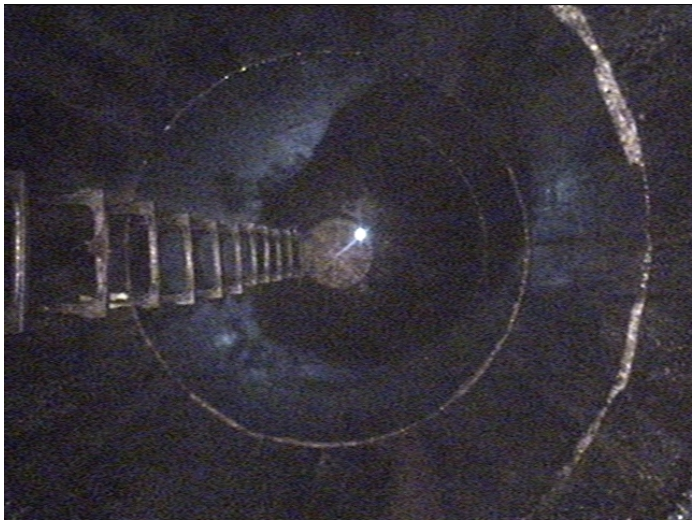
Street:	**Bronte Road**	Flow Control:	**Not Controlled**
City:	**Columbia, SC**	Year Renewed:	
Location:	**Other**	Tape/Media #:	**The Final 90**
Purpose:	**Capital Improvement Program Asses**	Dia/Height:	**36"**
Use:	**Sanitary**	Material:	**RCP**
Drain Area:	**SR14**	Lining:	
Category:	**NA**		
Comment:	**CCTV**		
Location Details:		Direction of Survey:	**Downstream**

US MH: **16082MH** DS MH: **16083MH** Total Length Surveyed (ft): **483.9**

O&M Index:	**3.18**	O&M Quick:	**513A**	O&M Rating:	**35**
Structural Index:	**1.00**	Structural Quick:	**1C00**	Structural Rating:	**20**
Overall Index:	**1.77**	Overall Quick:	**513A**	Overall Rating:	**55**

Position	Code	Observation	Video (sec)	Grade
16082MH				
.0	AMH	Manhole	0	NA
.0	MWL	Water Level	12	NA
12.3	IG	Infil Gusher	80	M 5
12.3	DAE	Deposits Attached Encrustation	93	M 3
29.5	DAE	Deposits Attached Encrustation	151	M 3
29.5	ID	Infil Dripper	152	M 3
111.6	OBZ	Obstacle Other	461	M 3
197.1	SRI(S01)	Surface Roughness Increased	706	S 1
202.6	SRI(F01)	Surface Roughness Increased	720	S 1
213.3	SRI	Surface Roughness Increased	750	S 1
225.5	DAGS	Deposits Attached Grease	780	M 3
245.5	DAGS	Deposits Attached Grease	836	M 3
351.3	DAR	Deposits Attached Ragging	1081	M 3
371.6	DAGS	Deposits Attached Grease	1168	M 3
388.2	SRI(S02)	Surface Roughness Increased	1224	S 1
447.7	DAGS	Deposits Attached Grease	1366	M 3
455.7	DAGS	Deposits Attached Grease	1386	M 3
479.6	SRI(F02)	Surface Roughness Increased	1446	S 1
483.9	AMH	Manhole	1462	NA
16083MH				

Camera Direction



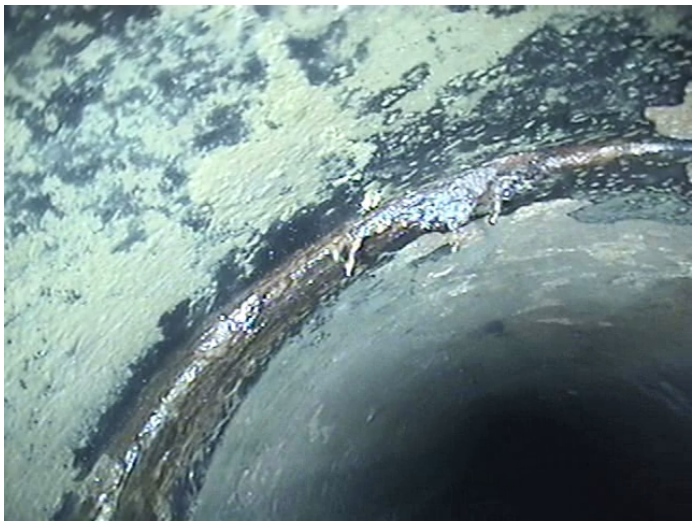
Code: **AMH**
Description: **Manhole**

Distance (ft): **.0**
Structural Grade: **0**
O&M Grade: **0**
Clock Start/From:
Clock To:
1st Value:
2nd Value:
Value Percent:
Continuous Index:
Within 8" of Joint: **NO**
Remarks: **16082MH**

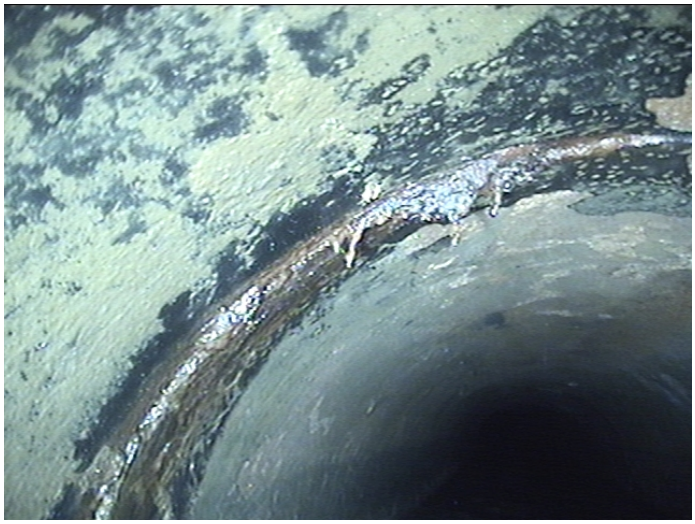
Code:	**MWL**
Description:	**Water Level**
Distance (ft):	**.0**
Structural Grade:	**0**
O&M Grade:	**0**
Clock Start/From:	
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	**20**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**IG**
Description:	**Infil Gusher**
Distance (ft):	**12.3**
Structural Grade:	**0**
O&M Grade:	**5**
Clock Start/From:	**10**
Clock To:	**12**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**DAE**
Description:	**Deposits Attached Encrustation**
Distance (ft):	**12.3**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**8**
Clock To:	**12**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	



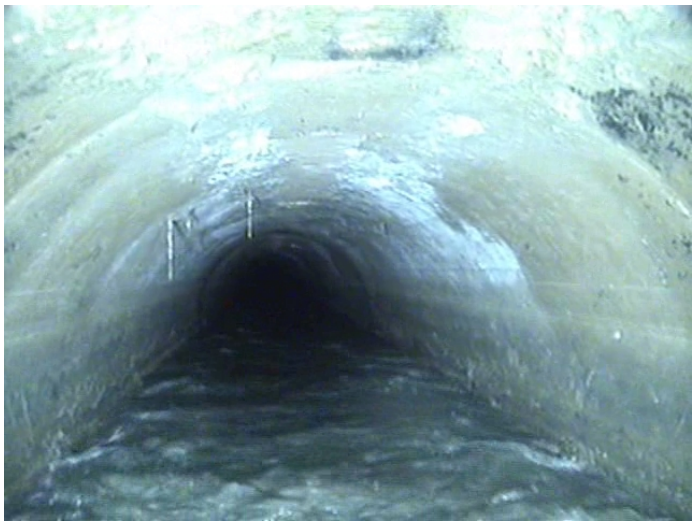
Code:	**DAE**
Description:	**Deposits Attached Encrustation**
Distance (ft):	**29.5**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**9**
Clock To:	**12**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**YES**
Remarks:	



Code:	**ID**
Description:	**Infil Dripper**
Distance (ft):	**29.5**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**10**
Clock To:	**12**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**OBZ**
Description:	**Obstacle Other**
Distance (ft):	**111.6**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**5**
Clock To:	**7**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	**debris/sediment - see sonar**

Code:	**SRI**
Description:	**Surface Roughness Increased**
Distance (ft):	**197.1**
Structural Grade:	**1**
O&M Grade:	**0**
Clock Start/From:	**11**
Clock To:	**1**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**S01**
Within 8" of Joint:	**YES**
Remarks:	



Code:	**SRI**
Description:	**Surface Roughness Increased**
Distance (ft):	**202.6**
Structural Grade:	**1**
O&M Grade:	**0**
Clock Start/From:	**11**
Clock To:	**1**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**F01**
Within 8" of Joint:	**YES**
Remarks:	

Code:	**SRI**
Description:	**Surface Roughness Increased**
Distance (ft):	**213.3**
Structural Grade:	**1**
O&M Grade:	**0**
Clock Start/From:	**11**
Clock To:	**2**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	
Within 8" of Joint:	**YES**
Remarks:	

Code:	**DAGS**
Description:	**Deposits Attached Grease**
Distance (ft):	**225.5**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**11**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**DAGS**
Description:	**Deposits Attached Grease**
Distance (ft):	**245.5**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**1**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**DAR**
Description:	**Deposits Attached Ragging**
Distance (ft):	**351.3**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**11**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**DAGS**
Description:	**Deposits Attached Grease**
Distance (ft):	**371.6**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**11**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**SRI**
Description:	**Surface Roughness Increased**
Distance (ft):	**388.2**
Structural Grade:	**1**
O&M Grade:	**0**
Clock Start/From:	**9**
Clock To:	**3**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**S02**
Within 8" of Joint:	**YES**
Remarks:	

Code:	**DAGS**
Description:	**Deposits Attached Grease**
Distance (ft):	**447.7**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**11**
Clock To:	**1**
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	

Code:	**DAGS**
Description:	**Deposits Attached Grease**
Distance (ft):	**455.7**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**12**
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	**5**
Continuous Index:	
Within 8" of Joint:	**YES**
Remarks:	

Code:	**SRI**
Description:	**Surface Roughness Increased**
Distance (ft):	**479.6**
Structural Grade:	**1**
O&M Grade:	**0**
Clock Start/From:	**9**
Clock To:	**3**
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	**F02**
Within 8" of Joint:	**YES**
Remarks:	

Code:	**AMH**
Description:	**Manhole**
Distance (ft):	**483.9**
Structural Grade:	**0**
O&M Grade:	**0**
Clock Start/From:	
Clock To:	
1st Value:	
2nd Value:	
Value Percent:	
Continuous Index:	
Within 8" of Joint:	**NO**
Remarks:	**16083MH**

HYDROMAX USA

Project Information

Surveyor Name	HYM_JAK	**Certificate Number**	U-206-2847
Owner	City of Columbia	**Customer**	City of Columbia
Drainage Area	SR14	**PO Number**	SS7278
Pipe Segment Reference	17964MH_16067MH	**Date**	5/19/2015 1:29:00 PM
Street	4500 Block Saint Andrews Rd.	**City**	Columbia, SC
Comments			

Manhole

Upstream MH	17964MH	**Rim to Invert (U)**	17
Grade to Invert (U)	16.4	**Rim to Grade (U)**	0.6
Downstream MH	16067MH	**Rim to Invert (D)**	17
Grade to Invert (D)	15.5	**Rim to Grade (D)**	1.5
Sewer Use	Sanitary	**Direction of Survey**	Downstream

Pipe

Height (Diameter)	30	**Width**	30
Shape	Circular	**Material**	Reinforced Concrete Pipe
Lining Method		**Pipe Joint Length**	13
Total Length	610.7	**Length Surveyed**	610.7
Year Laid		**Year Renewed**	

Misc

Flow Control	Not Controlled	**Media Label**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Easement/Right of Way
Additional Info	CCTV / easement	**Location Details**	Easement next to river

Custom

Number of Taps	0	**Number of Roots**	0
Num Cracks / Fractures	2	**Number of Broken / Holes / Collapse**	0
Number of Deposits	26	**PACP Quick Structure**	HYM
PACP Quick Maintenance		**PACP Quick Overall**	20171215
OM Grade		**Overall Grade**	

Pacp 6

Reverse Setup ID	0	**Sheet (Group) Number**	1
Imperial Units (US)	True	**Pressure Value**	0
Work Order		**Project**	15-30 Inch Gravity Sewer Assessment
		Completed	

Project: 15-30 Inch Gravity Sewer Assessment

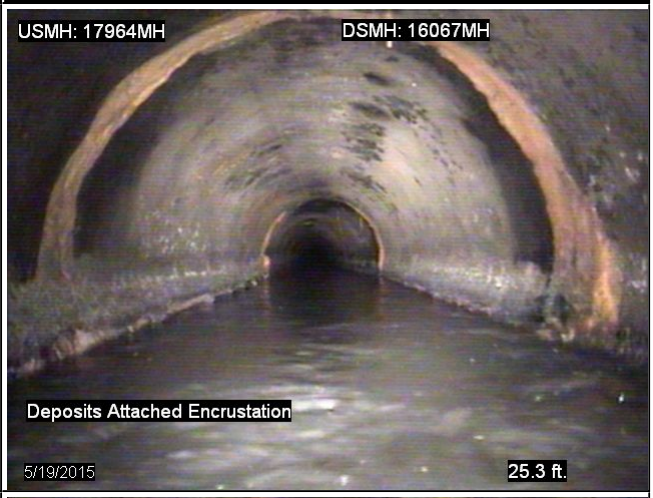
Date: 5/19/2015 1:29:00 PM

Street: 4500 Block Saint Andrews Rd.
Length Surveyed: 610.7
Pacp Quick Overall Rating: 5141
Height (Diameter): 30
Street: 4500 Block Saint Andrews Rd.

Pipe Segment Reference: 17964MH_16067MH
Upstream MH: 17964MH
Downstream MH: 16067MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

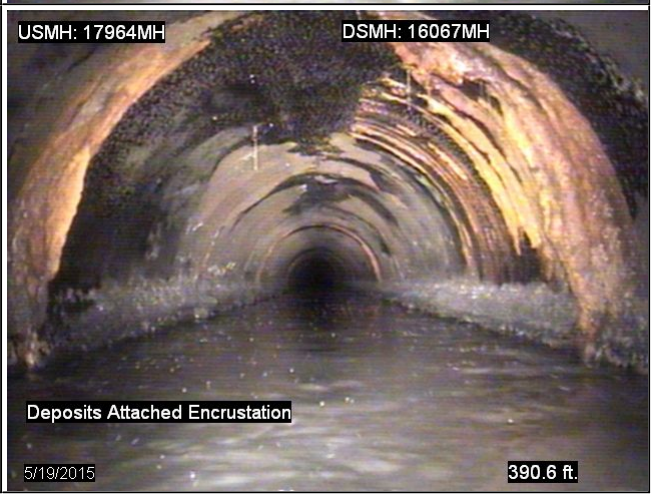
Distance	Fault Observation	Time	Picture
0.0	**Manhole** **Severity: None** **Percent: 0** **Attention Required** **Remarks: 17964MH**	9	
0.0	**Water Level** **Severity: None** **Percent: 20** **Attention Required**	38	
0.0	**General Observation** **Severity: None** **Percent: 0** **Attention Required** **Remarks: encrustation in manhole**	1:10	

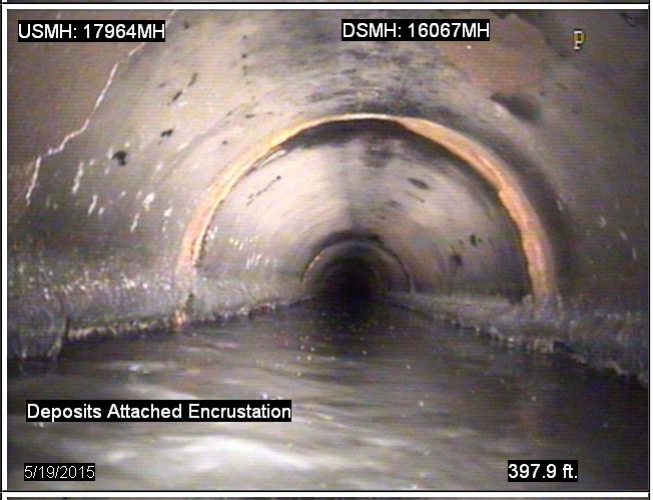
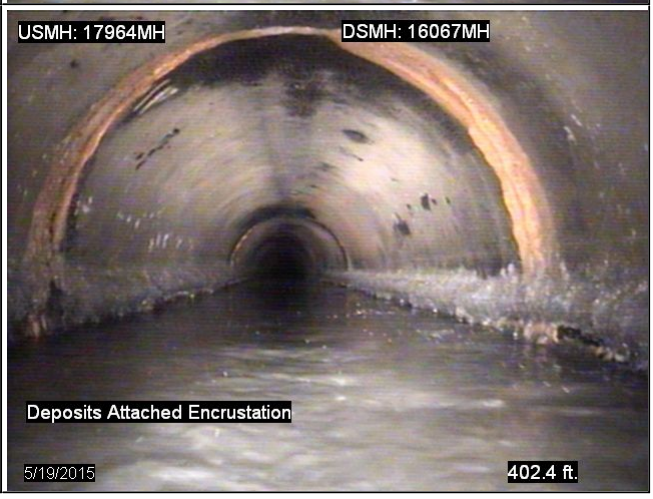
Distance	Fault Observation	Time	Picture
13.5	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	04:16	
13.5	Surface Spalling Other Position: 9 To 4 Severity: None Cont Defect: S01 Percent: 0 Attention Required Remarks: wanders Struct Weight: 2	04:50	
15.2	Deposits Attached Grease Position: 8 To 4 Severity: None Cont Defect: S02 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	05:58	

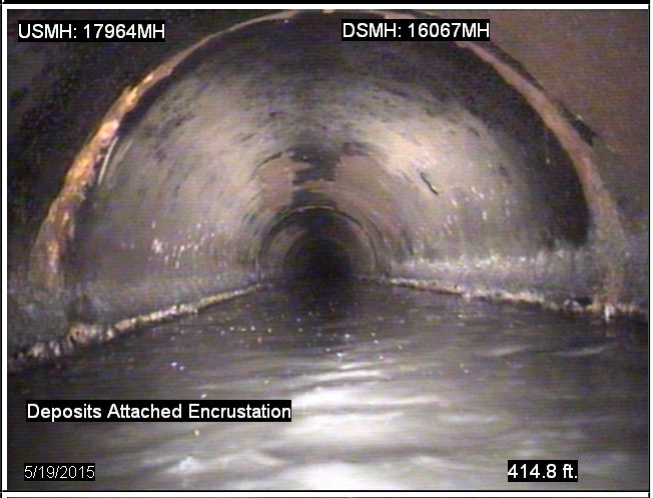
Distance	Fault Observation	Time	Picture
25.3	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	8:10	
38.0	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	09:34	
39.0	Deposits Settled Other Position: 6 Severity: None Cont Defect: S03 Percent: 5 Attention Required Remarks: under water Maint Weight: 2	10:35	

Distance	Fault Observation	Time	Picture
61.8	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	12:52	
86.4	Deposits Attached Encrustation Position: 8 To 3 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	15:06	
98.5	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	16:44	

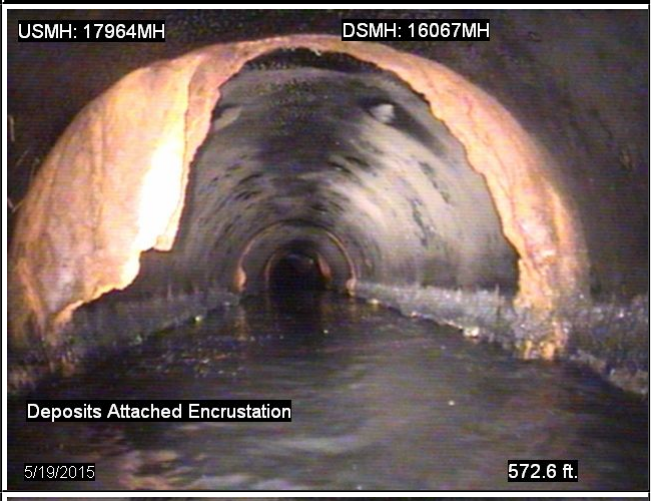
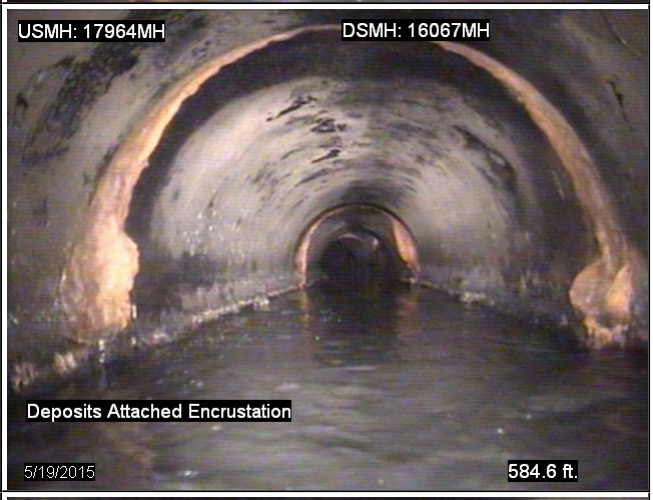
Distance	Fault Observation	Time	Picture
110.9	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	18:08	
208.1	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	23:57	
281.0	Deposits Attached Encrustation Position: 10 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	30:00	

Distance	Fault Observation	Time	Picture
293.2	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	31:39	
365.9	Deposits Attached Encrustation Position: 9 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	36:35	
390.6	Deposits Attached Encrustation Position: 8 To 4 Severity: None Cont Defect: S04 Percent: 10 Joint Attention Required Maint Weight: 2	39:22	

Distance	Fault Observation	Time	Picture
390.6	Crack Longitudinal Position: 12 Severity: None Percent: 0 Attention Required Struct Weight: 2	39:54	
397.9	Deposits Attached Encrustation Position: 8 To 4 Severity: None Cont Defect: F04 Percent: 10 Attention Required Maint Weight: 2	40:49	
402.4	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	41:57	

Distance	Fault Observation	Time	Picture
414.8	Deposits Attached Encrustation Position: 8 To 10 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	43:30	
475.7	Deposits Attached Encrustation Position: 8 To 3 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	46:53	
512.0	Deposits Attached Encrustation Position: 8 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	49:42	

Distance	Fault Observation	Time	Picture
523.7	Fracture Longitudinal Position: 12 Severity: None Percent: 0 Joint Attention Required Struct Weight: 3	52:38	
523.7	Deposits Attached Encrustation Position: 8 To 12 Severity: None Percent: 5 Attention Required Maint Weight: 2	53:10	
533.6	Deposits Attached Encrustation Position: 1 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	53:58	

Distance	Fault Observation	Time	Picture
572.6	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 35 Joint Attention Required Maint Weight: 5	56:53	
584.6	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Attention Required Maint Weight: 2	58:27	
596.6	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 10 Joint Attention Required Maint Weight: 2	1:00:13	

Distance	Fault Observation	Time	Picture
596.6	Infil Runner Position: 8 Severity: None Percent: 0 Joint Attention Required Maint Weight: 4	1:00:32	
608.1	Deposits Settled Other Position: 6 Severity: None Cont Defect: F03 Percent: 5 Attention Required Remarks: under water Maint Weight: 2	1:01:22	
608.1	Surface Spalling Other Position: 9 To 4 Severity: None Cont Defect: F01 Percent: 0 Attention Required Remarks: wanders Struct Weight: 2	1:01:39	

Distance	Fault Observation	Time	Picture
608.1	Deposits Attached Grease Position: 8 To 4 Severity: None Cont Defect: F02 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	1:01:56	
610.7	General Observation Severity: None Percent: 0 Attention Required Remarks: encrustation in manhole	1:03:17	
610.7	Manhole Severity: None Percent: 0 Attention Required Remarks: 16067MH	1:03:47	

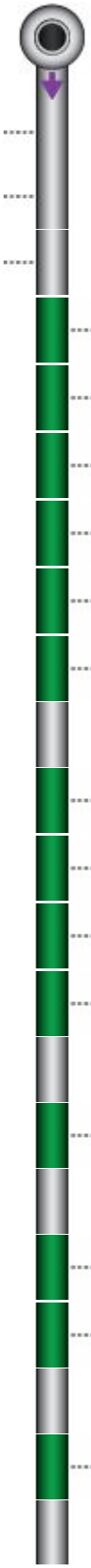
Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/19/2015 1:29:00 PM

Street: 4500 Block Saint Andrews Rd.
Length Surveyed: 610.7
Pacp Quick Overall Rating: 5141
Height (Diameter): 30
Street: 4500 Block Saint Andrews Rd.

Pipe Segment Reference: 17964MH_16067MH
Upstream MH: 17964MH
Downstream MH: 16067MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe



ID Number: 17964MH

(0.0) AMH - Manhole Remark: 17964MH

(0.0) MWL - Water Level

(0.0) MGO - General Observation Remark: encrustation in manhole

(13.5) DAE - Deposits Attached Encrustation - Position: 8 To 4

(13.5) SSSZ - Surface Spalling Other - Position: 9 To 4 - Cont Def: S01 Remark: wanders

(15.2) DAGS - Deposits Attached Grease - Position: 8 To 4 - Cont Def: S02 Remark: wanders

(25.3) DAE - Deposits Attached Encrustation - Position: 8 To 4

(38.0) DAE - Deposits Attached Encrustation - Position: 8 To 4

(39.0) DSZ - Deposits Settled Other - Position: 6 - Cont Def: S03 Remark: under water

(61.8) DAE - Deposits Attached Encrustation - Position: 8 To 4

(86.4) DAE - Deposits Attached Encrustation - Position: 8 To 3

(98.5) DAE - Deposits Attached Encrustation - Position: 8 To 4

(110.9) DAE - Deposits Attached Encrustation - Position: 8 To 4

(208.1) DAE - Deposits Attached Encrustation - Position: 8 To 4

(281.0) DAE - Deposits Attached Encrustation - Position: 10 To 4

(293.2) DAE - Deposits Attached Encrustation - Position: 8 To 4

(365.9) DAE - Deposits Attached Encrustation - Position: 9 To 4

(390.6) DAE - Deposits Attached Encrustation - Position: 8 To 4 - Cont Def: S04

(390.6) CL - Crack Longitudinal - Position: 12

(397.9) DAE - Deposits Attached Encrustation - Position: 8 To 4 - Cont Def: F04

(402.4) DAE - Deposits Attached Encrustation - Position: 8 To 4

(414.8) DAE - Deposits Attached Encrustation - Position: 8 To 10

(475.7) DAE - Deposits Attached Encrustation - Position: 8 To 3

(512.0) DAE - Deposits Attached Encrustation - Position: 8

(523.7) FL - Fracture Longitudinal - Position: 12

(523.7) DAE - Deposits Attached Encrustation - Position: 8 To 12

(533.6) DAE - Deposits Attached Encrustation - Position: 1 To 4

(572.6) DAE - Deposits Attached Encrustation - Position: 8 To 4

(584.6) DAE - Deposits Attached Encrustation - Position: 8 To 4

(596.6) DAE - Deposits Attached Encrustation - Position: 8 To 4

(596.6) IR - Infil Runner - Position: 8

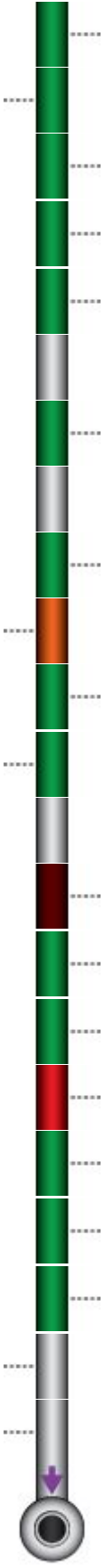
(608.1) DSZ - Deposits Settled Other - Position: 6 - Cont Def: F03 Remark: under water

(608.1) SSSZ - Surface Spalling Other - Position: 9 To 4 - Cont Def: F01 Remark: wanders

(608.1) DAGS - Deposits Attached Grease - Position: 8 To 4 - Cont Def: F02 Remark: wanders

(610.7) MGO - General Observation Remark: encrustation in manhole

(610.7) AMH - Manhole Remark: 16067MH



Total Distance: 610.7

ID Number: 16067MH

Nassco C.C.T.V. Defect Code Information

Session Information			
Surveyors Name	HYM_JAK	**Certificate Number**	U-206-2847
System Owner	City of Columbia	**Survey Customer**	City of Columbia
Drainage Area	SR14		
P/O Number	SS7278	**Pipeline Segment Ref**	17964MH_16067MH
Date	5/19/2015	**Time**	13:29
Location	4500 Block Saint Andrews Rd.		
Locality	Columbia, SC		
Further Location Details: Easement next to river			
Manhole Information			
Upstream Manhole Number: 17964MH			
Rim to Invert	17	**Grade to Invert**	16.4
Rim to Grade	0.6		
Downstream Manhole Number: 16067MH			
Rim to Invert	17	**Grade to Invert**	15.5
Rim to Grade	1.5		
Sewer			
Use of Sewer	Sanitary	**Direction**	Downstream
Flow Control	Not Controlled	**Height**	30
Width	30	**Shape**	Circular
Material	Reinforced Concrete Pipe	**Lining Method**	
Pipe Joint Length	13	**Total Length**	610.7
Length Surveyed	610.7	**Year Laid**	
Year Rehabilitated		**Tape/Media Number**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Easement/Right of Way
Additional Information	CCTV / easement		

Nassco C.C.T.V. Defect Code Information

Grade	Structural	O&M	Overall
5	0	5	5
4	0	4	4
3	3	0	3
2	4	44	48
1	0	0	0
Overall	7	53	60
Number of Defects	3	24	27
Pipe Rating	3122	5141	5141
Pipe Ratings Index	2	2	2

Nassco C.C.T.V. Defect Code Information

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	9	AMH - Manhole				0			
		17964MH							
0	38	MWL - Water Level				20			
0	70	MGO - General Observation				0			
		encrustation in manhole							
13.5	256	DAE - Deposits Attached Encrustation				5	X	8	4
13.5	290	SSSZ - Surface Spalling Other	S01			0		9	4
		wanders							
15.2	358	DAGS - Deposits Attached Grease	S02			5		8	4
		wanders							
25.3	490	DAE - Deposits Attached Encrustation				5	X	8	4
38	574	DAE - Deposits Attached Encrustation				5	X	8	4
39	635	DSZ - Deposits Settled Other	S03			5		6	
		under water							
61.8	772	DAE - Deposits Attached Encrustation				5	X	8	4
86.4	906	DAE - Deposits Attached Encrustation				5	X	8	3
98.5	1004	DAE - Deposits Attached Encrustation				5	X	8	4
110.9	1088	DAE - Deposits Attached Encrustation				5	X	8	4
208.1	1437	DAE - Deposits Attached Encrustation				5	X	8	4
281	1800	DAE - Deposits Attached Encrustation				5	X	10	4
293.2	1899	DAE - Deposits Attached Encrustation				5	X	8	4
365.9	2195	DAE - Deposits Attached Encrustation				5	X	9	4
390.6	2362	DAE - Deposits Attached Encrustation	S04			10	X	8	4
390.6	2394	CL - Crack Longitudinal				0		12	
397.9	2449	DAE - Deposits Attached Encrustation	F04			10		8	4
402.4	2517	DAE - Deposits Attached Encrustation				5	X	8	4

414.8	2610	DAE - Deposits Attached Encrustation			5	X	8	10
475.7	2813	DAE - Deposits Attached Encrustation			5	X	8	3
512	2982	DAE - Deposits Attached Encrustation			5	X	8	
523.7	3158	FL - Fracture Longitudinal			0	X	12	
523.7	3190	DAE - Deposits Attached Encrustation			5		8	12
533.6	3238	DAE - Deposits Attached Encrustation			5	X	1	4
572.6	3413	DAE - Deposits Attached Encrustation			35	X	8	4
584.6	3507	DAE - Deposits Attached Encrustation			5		8	4
596.6	3613	DAE - Deposits Attached Encrustation			10	X	8	4
596.6	3632	IR - Infil Runner			0	X	8	
608.1	3682	DSZ - Deposits Settled Other	F03		5		6	
		under water						
608.1	3699	SSSZ - Surface Spalling Other	F01		0		9	4
		wanders						
608.1	3716	DAGS - Deposits Attached Grease	F02		5		8	4
		wanders						
610.7	3797	MGO - General Observation			0			
		encrustation in manhole						
610.7	3827	AMH - Manhole			0			
		16067MH						

Videos Created for Session 15-30 Inch Gravity Sewer Assessment

17964MH_16067MH_20150519.mpg Size: 822 MB

Additional Reports for Session 15-30 Inch Gravity Sewer Assessment

Created with the  report generator

HYDROMAX USA

Project Information

Surveyor Name	HYM_JAK	**Certificate Number**	U-206-2847
Owner	City of Columbia	**Customer**	City of Columbia
Drainage Area	SR14	**PO Number**	SS7278
Pipe Segment Reference	18691MH_18690MH	**Date**	5/15/2015 11:11:00 AM
Street	200 Block Woodwinds Dr.	**City**	Columbia, SC
Comments			

Manhole

Upstream MH	18691MH	**Rim to Invert (U)**	15
Grade to Invert (U)	12.6	**Rim to Grade (U)**	2.4
Downstream MH	18690MH	**Rim to Invert (D)**	14.7
Grade to Invert (D)	14.7	**Rim to Grade (D)**	0
Sewer Use	Sanitary	**Direction of Survey**	Downstream

Pipe

Height (Diameter)	30	**Width**	30
Shape	Circular	**Material**	Reinforced Concrete Pipe
Lining Method		**Pipe Joint Length**	13
Total Length	521.4	**Length Surveyed**	521.4
Year Laid		**Year Renewed**	

Misc

Flow Control	Not Controlled	**Media Label**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Woods
Additional Info	CCTV / easement	**Location Details**	Woods next to river

Custom

Number of Taps	0	**Number of Roots**	0
Num Cracks / Fractures	0	**Number of Broken / Holes / Collapse**	0
Number of Deposits	8	**PACP Quick Structure**	HYM
PACP Quick Maintenance		**PACP Quick Overall**	20171215
OM Grade		**Overall Grade**	

Pacp 6

Reverse Setup ID	0	**Sheet (Group) Number**	1
Imperial Units (US)	True	**Pressure Value**	0
Work Order		**Project**	15-30 Inch Gravity Sewer Assessment
		Completed	

Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/15/2015 11:11:00 AM

Street: 200 Block Woodwinds Dr.
Length Surveyed: 521.4
Pacp Quick Overall Rating: 2700
Height (Diameter): 30
Street: 200 Block Woodwinds Dr.

Pipe Segment Reference: 18691MH_18690MH
Upstream MH: 18691MH
Downstream MH: 18690MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Distance	Fault Observation	Time	Picture
0.0	**Manhole** **Severity: None** **Percent: 0** **Attention Required** **Remarks: 18691MH**	11	
0.0	**Water Level** **Severity: None** **Percent: 15** **Attention Required**	01:12	
7.0	**Deposits Attached Grease** **Position: 7 To 5** **Severity: None** **Cont Defect: S01** **Percent: 5** **Attention Required** **Remarks: wanders** **Maint Weight: 2**	04:51	

Distance	Fault Observation	Time	Picture
84.3	Deposits Attached Encrustation Position: 2 To 3 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	11:02	
132.5	Deposits Attached Encrustation Position: 7 To 4 Severity: None Percent: 5 Attention Required Maint Weight: 2	16:04	
240.5	Obstacle Other Position: 6 Severity: None Percent: 10 Attention Required Remarks: under water Maint Weight: 2	22:23	

Distance	Fault Observation	Time	Picture
253.5	Deposits Attached Encrustation Position: 12 To 5 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	24:41	
278.4	Deposits Settled Other Position: 6 Severity: None Cont Defect: S02 Percent: 10 Attention Required Remarks: under water Maint Weight: 2	26:53	
325.8	Deposits Attached Encrustation Position: 8 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	30:32	

Distance	Fault Observation	Time	Picture
518.6	Deposits Attached Grease Position: 7 To 5 Severity: None Cont Defect: F01 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	44:18	
518.6	Deposits Settled Other Position: 6 Severity: None Cont Defect: F02 Percent: 10 Attention Required Remarks: under water Maint Weight: 2	44:33	
521.4	General Observation Severity: None Percent: 0 Attention Required Remarks: encrustation in manhole	47:04	

Distance	Fault Observation	Time	Picture
521.4	Manhole Severity: None Percent: 0 Attention Required Remarks: 18690MH	47:18	

Created with the POSM report generator

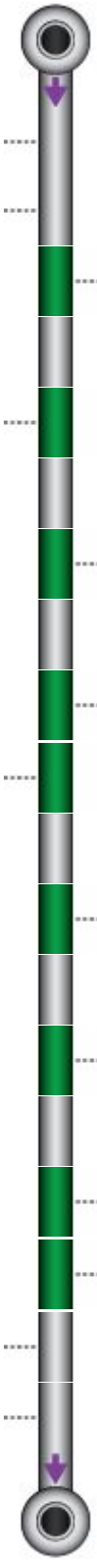
Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/15/2015 11:11:00 AM

Street: 200 Block Woodwinds Dr.
Length Surveyed: 521.4
Pacp Quick Overall Rating: 2700
Height (Diameter): 30
Street: 200 Block Woodwinds Dr.

Pipe Segment Reference: 18691MH_18690MH
Upstream MH: 18691MH
Downstream MH: 18690MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe



ID Number: 18691MH

(0.0) AMH - Manhole Remark: 18691MH

(0.0) MWL - Water Level

(7.0) DAGS - Deposits Attached Grease - Position: 7 To 5 - Cont Def: S01 Remark: wanders

(84.3) DAE - Deposits Attached Encrustation - Position: 2 To 3

(132.5) DAE - Deposits Attached Encrustation - Position: 7 To 4

(240.5) OBZ - Obstacle Other - Position: 6 Remark: under water

(253.5) DAE - Deposits Attached Encrustation - Position: 12 To 5

(278.4) DSZ - Deposits Settled Other - Position: 6 - Cont Def: S02 Remark: under water

(325.8) DAE - Deposits Attached Encrustation - Position: 8

(518.6) DAGS - Deposits Attached Grease - Position: 7 To 5 - Cont Def: F01 Remark: wanders

(518.6) DSZ - Deposits Settled Other - Position: 6 - Cont Def: F02 Remark: under water

(521.4) MGO - General Observation Remark: encrustation in manhole

(521.4) AMH - Manhole Remark: 18690MH

Total Distance: 521.4

ID Number: 18690MH

Nassco C.C.T.V. Defect Code Information

Session Information			
Surveyors Name	HYM_JAK	**Certificate Number**	U-206-2847
System Owner	City of Columbia	**Survey Customer**	City of Columbia
Drainage Area	SR14		
P/O Number	SS7278	**Pipeline Segment Ref**	18691MH_18690MH
Date	5/15/2015	**Time**	11:11
Location	200 Block Woodwinds Dr.		
Locality	Columbia, SC		
Further Location Details: Woods next to river			
Manhole Information			
Upstream Manhole Number: 18691MH			
Rim to Invert	15	**Grade to Invert**	12.6
Rim to Grade	2.4		
Downstream Manhole Number: 18690MH			
Rim to Invert	14.7	**Grade to Invert**	14.7
Rim to Grade	0		
Sewer			
Use of Sewer	Sanitary	**Direction**	Downstream
Flow Control	Not Controlled	**Height**	30
Width	30	**Shape**	Circular
Material	Reinforced Concrete Pipe	**Lining Method**	
Pipe Joint Length	13	**Total Length**	521.4
Length Surveyed	521.4	**Year Laid**	
Year Rehabilitated		**Tape/Media Number**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Woods
Additional Information	CCTV / easement		

Nassco C.C.T.V. Defect Code Information

Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	14	14
1	0	0	0
Overall	0	14	14
Number of Defects	0	7	7
Pipe Rating	0000	2700	2700
Pipe Ratings Index	0	2	2

Nassco C.C.T.V. Defect Code Information

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	11	AMH - Manhole				0			
		18691MH							
0	72	MWL - Water Level				15			
7	291	DAGS - Deposits Attached Grease	S01			5		7	5
		wanders							
84.3	662	DAE - Deposits Attached Encrustation				5	X	2	3
132.5	964	DAE - Deposits Attached Encrustation				5		7	4
240.5	1343	OBZ - Obstacle Other				10		6	
		under water							
253.5	1481	DAE - Deposits Attached Encrustation				5	X	12	5
278.4	1613	DSZ - Deposits Settled Other	S02			10		6	
		under water							
325.8	1832	DAE - Deposits Attached Encrustation				5	X	8	
518.6	2658	DAGS - Deposits Attached Grease	F01			5		7	5
		wanders							
518.6	2673	DSZ - Deposits Settled Other	F02			10		6	
		under water							
521.4	2824	MGO - General Observation				0			
		encrustation in manhole							
521.4	2838	AMH - Manhole				0			
		18690MH							

Videos Created for Session 15-30 Inch Gravity Sewer Assessment

18691MH_18690MH_20150515.mpg Size: 610 MB

Additional Reports for Session 15-30 Inch Gravity Sewer Assessment

Created with the  report generator

HYDROMAX USA

Project Information

Surveyor Name	HYM_JAK	**Certificate Number**	U-206-2847
Owner	City of Columbia	**Customer**	City of Columbia
Drainage Area	SR14	**PO Number**	SS7278
Pipe Segment Reference	18969MH_18967MH	**Date**	5/14/2015 3:05:00 PM
Street	200 Block Woodwinds Dr.	**City**	Columbia, SC
Comments			

Manhole

Upstream MH	18969MH	**Rim to Invert (U)**	13.4
Grade to Invert (U)	12.1	**Rim to Grade (U)**	1.3
Downstream MH	18967MH	**Rim to Invert (D)**	10.3
Grade to Invert (D)	9	**Rim to Grade (D)**	1.3
Sewer Use	Sanitary	**Direction of Survey**	Downstream

Pipe

Height (Diameter)	15	**Width**	15
Shape	Circular	**Material**	Reinforced Concrete Pipe
Lining Method		**Pipe Joint Length**	13
Total Length	346.8	**Length Surveyed**	346.8
Year Laid		**Year Renewed**	

Misc

Flow Control	Not Controlled	**Media Label**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Woods
Additional Info	CCTV / easement	**Location Details**	Woods next to river

Custom

Number of Taps	0	**Number of Roots**	1
Num Cracks / Fractures	0	**Number of Broken / Holes / Collapse**	0
Number of Deposits	7	**PACP Quick Structure**	HYM
PACP Quick Maintenance		**PACP Quick Overall**	20171215
OM Grade		**Overall Grade**	

Pacp 6

Reverse Setup ID	0	**Sheet (Group) Number**	1
Imperial Units (US)	True	**Pressure Value**	0
Work Order		**Project**	15-30 Inch Gravity Sewer Assessment
		Completed	

Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/14/2015 3:05:00 PM

Street: 200 Block Woodwinds Dr.
Length Surveyed: 346.8
Pacp Quick Overall Rating: 3128
Height (Diameter): 15
Street: 200 Block Woodwinds Dr.

Pipe Segment Reference: 18969MH_18967MH
Upstream MH: 18969MH
Downstream MH: 18967MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Distance	Fault Observation	Time	Picture
0.0	**Manhole** **Severity: None** **Percent: 0** **Attention Required** **Remarks: 18969MH**	9	
0.0	**Water Level** **Severity: None** **Percent: 25** **Attention Required**	28	
3.8	**Obstacle Other** **Position: 6** **Severity: None** **Percent: 10** **Attention Required** **Remarks: under water** **Maint Weight: 2**	01:23	

Distance	Fault Observation	Time	Picture
3.8	Deposits Attached Grease Position: 8 To 4 Severity: None Cont Defect: S01 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	02:12	
7.8	Obstacle Other Position: 6 Severity: None Percent: 10 Attention Required Remarks: under water Maint Weight: 2	04:32	
13.0	Deposits Settled Other Position: 6 Severity: None Cont Defect: S02 Percent: 10 Attention Required Remarks: under water Maint Weight: 2	05:27	

Distance	Fault Observation	Time	Picture
18.0	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	06:51	
103.2	Deposits Attached Encrustation Position: 7 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	11:59	
150.2	Surface Spalling Other Position: 12 Severity: None Percent: 0 Attention Required Struct Weight: 2	15:39	

Distance	Fault Observation	Time	Picture
175.4	Deposits Attached Encrustation Position: 7 To 5 Severity: None Percent: 15 Joint Attention Required Maint Weight: 3	18:22	
284.5	Surface Spalling Other Position: 12 To 2 Severity: None Percent: 0 Joint Attention Required Struct Weight: 2	25:22	
308.1	Roots Fine Joint Position: 1 Severity: None Percent: 0 Joint Attention Required Maint Weight: 1	27:44	

Distance	Fault Observation	Time	Picture
343.3	Deposits Settled Other Position: 6 Severity: None Cont Defect: F02 Percent: 10 Attention Required Remarks: under water Maint Weight: 2	29:41	
343.3	Deposits Attached Grease Position: 8 To 4 Severity: None Cont Defect: F01 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	29:51	
346.8	General Observation Severity: None Percent: 0 Attention Required Remarks: encrustation in manhole	32:55	

Distance	Fault Observation	Time	Picture
346.8	Manhole Severity: None Percent: 0 Attention Required Remarks: 18967MH	33:05	

Created with the POSM report generator

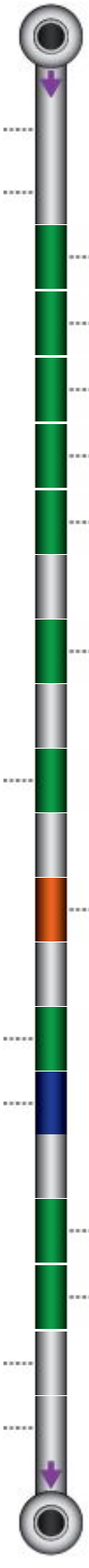
Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/14/2015 3:05:00 PM

Street: 200 Block Woodwinds Dr.
Length Surveyed: 346.8
Pacp Quick Overall Rating: 3128
Height (Diameter): 15
Street: 200 Block Woodwinds Dr.

Pipe Segment Reference: 18969MH_18967MH
Upstream MH: 18969MH
Downstream MH: 18967MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe



ID Number: 18969MH

(0.0) AMH - Manhole Remark: 18969MH

(0.0) MWL - Water Level

(3.8) OBZ - Obstacle Other - Position: 6 Remark: under water

(3.8) DAGS - Deposits Attached Grease - Position: 8 To 4 - Cont Def: S01 Remark: wanders

(7.8) OBZ - Obstacle Other - Position: 6 Remark: under water

(13.0) DSZ - Deposits Settled Other - Position: 6 - Cont Def: S02 Remark: under water

(18.0) DAE - Deposits Attached Encrustation - Position: 8 To 4

(103.2) DAE - Deposits Attached Encrustation - Position: 7 To 4

(150.2) SSSZ - Surface Spalling Other - Position: 12

(175.4) DAE - Deposits Attached Encrustation - Position: 7 To 5

(284.5) SSSZ - Surface Spalling Other - Position: 12 To 2

(308.1) RFJ - Roots Fine Joint - Position: 1

(343.3) DSZ - Deposits Settled Other - Position: 6 - Cont Def: F02 Remark: under water

(343.3) DAGS - Deposits Attached Grease - Position: 8 To 4 - Cont Def: F01 Remark: wanders

(346.8) MGO - General Observation Remark: encrustation in manhole

(346.8) AMH - Manhole Remark: 18967MH

Total Distance: 346.8

ID Number: 18967MH

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Nassco C.C.T.V. Defect Code Information

Session Information			
Surveyors Name	HYM_JAK	**Certificate Number**	U-206-2847
System Owner	City of Columbia	**Survey Customer**	City of Columbia
Drainage Area	SR14		
P/O Number	SS7278	**Pipeline Segment Ref**	18969MH_18967MH
Date	5/14/2015	**Time**	15:05
Location	200 Block Woodwinds Dr.		
Locality	Columbia, SC		
Further Location Details: Woods next to river			
Manhole Information			
Upstream Manhole Number: 18969MH			
Rim to Invert	13.4	**Grade to Invert**	12.1
Rim to Grade	1.3		
Downstream Manhole Number: 18967MH			
Rim to Invert	10.3	**Grade to Invert**	9
Rim to Grade	1.3		
Sewer			
Use of Sewer	Sanitary	**Direction**	Downstream
Flow Control	Not Controlled	**Height**	15
Width	15	**Shape**	Circular
Material	Reinforced Concrete Pipe	**Lining Method**	
Pipe Joint Length	13	**Total Length**	346.8
Length Surveyed	346.8	**Year Laid**	
Year Rehabilitated		**Tape/Media Number**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Woods
Additional Information	CCTV / easement		

Nassco C.C.T.V. Defect Code Information

Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	3	3
2	4	12	16
1	0	1	1
Overall	4	16	20
Number of Defects	2	8	10
Pipe Rating	2200	3126	3128
Pipe Ratings Index	2	2	2

Nassco C.C.T.V. Defect Code Information

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	9	AMH - Manhole				0			
		18969MH							
0	28	MWL - Water Level				25			
3.8	83	OBZ - Obstacle Other				10		6	
		under water							
3.8	132	DAGS - Deposits Attached Grease	S01			5		8	4
		wanders							
7.8	272	OBZ - Obstacle Other				10		6	
		under water							
13	327	DSZ - Deposits Settled Other	S02			10		6	
		under water							
18	411	DAE - Deposits Attached Encrustation				5	X	8	4
103.2	719	DAE - Deposits Attached Encrustation				5	X	7	4
150.2	939	SSSZ - Surface Spalling Other				0		12	
175.4	1102	DAE - Deposits Attached Encrustation				15	X	7	5
284.5	1522	SSSZ - Surface Spalling Other				0	X	12	2
308.1	1664	RFJ - Roots Fine Joint				0	X	1	
343.3	1781	DSZ - Deposits Settled Other	F02			10		6	
		under water							
343.3	1791	DAGS - Deposits Attached Grease	F01			5		8	4
		wanders							
346.8	1975	MGO - General Observation				0			
		encrustation in manhole							
346.8	1985	AMH - Manhole				0			
		18967MH							

Videos Created for Session 15-30 Inch Gravity Sewer Assessment

18969MH_18967MH_20150514.mpg Size: 428 MB

Additional Reports for Session 15-30 Inch Gravity Sewer Assessment

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HYDROMAX USA

Project Information

Surveyor Name	HYM_JAK	**Certificate Number**	U-206-2847
Owner	City of Columbia	**Customer**	City of Columbia
Drainage Area	SR14	**PO Number**	SS7278
Pipe Segment Reference	18986MH_18691MH	**Date**	5/15/2015 9:48:00 AM
Street	200 Block Woodwinds Dr.	**City**	Columbia, SC
Comments			

Manhole

Upstream MH	18986MH	**Rim to Invert (U)**	11.6
Grade to Invert (U)	9.2	**Rim to Grade (U)**	2.4
Downstream MH	18691MH	**Rim to Invert (D)**	15
Grade to Invert (D)	12.6	**Rim to Grade (D)**	2.4
Sewer Use	Sanitary	**Direction of Survey**	Downstream

Pipe

Height (Diameter)	30	**Width**	30
Shape	Circular	**Material**	Reinforced Concrete Pipe
Lining Method		**Pipe Joint Length**	13
Total Length	522.6	**Length Surveyed**	522.6
Year Laid		**Year Renewed**	

Misc

Flow Control	Not Controlled	**Media Label**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Woods
Additional Info	CCTV / easement	**Location Details**	Woods next to river

Custom

Number of Taps	0	**Number of Roots**	1
Num Cracks / Fractures	0	**Number of Broken / Holes / Collapse**	0
Number of Deposits	9	**PACP Quick Structure**	HYM
PACP Quick Maintenance		**PACP Quick Overall**	20171215
OM Grade		**Overall Grade**	

Pacp 6

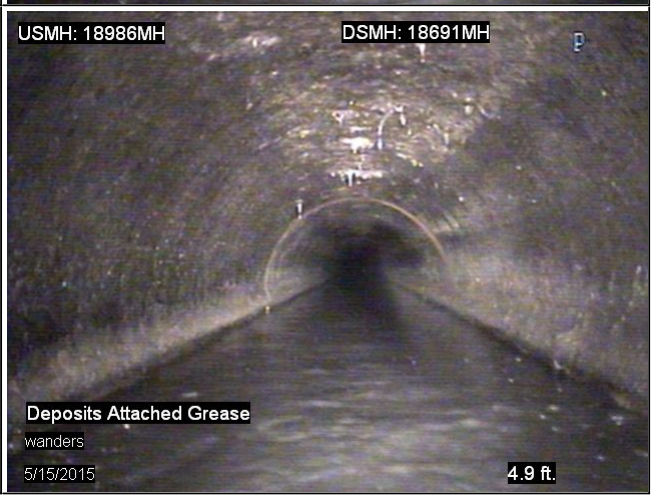
Reverse Setup ID	0	**Sheet (Group) Number**	1
Imperial Units (US)	True	**Pressure Value**	0
Work Order		**Project**	15-30 Inch Gravity Sewer Assessment
		Completed	

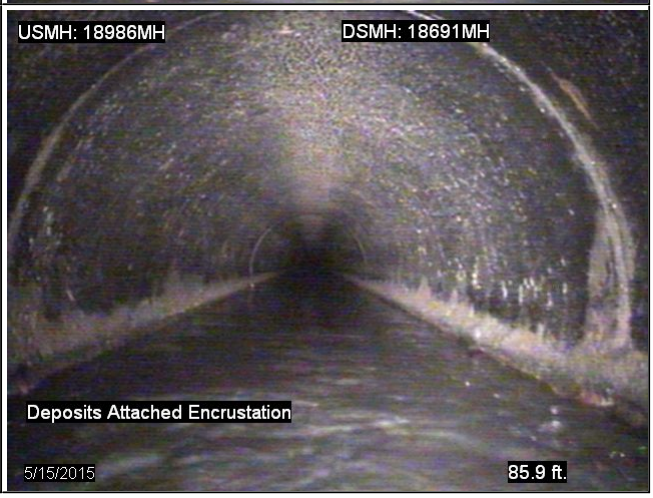
Project: 15-30 Inch Gravity Sewer Assessment

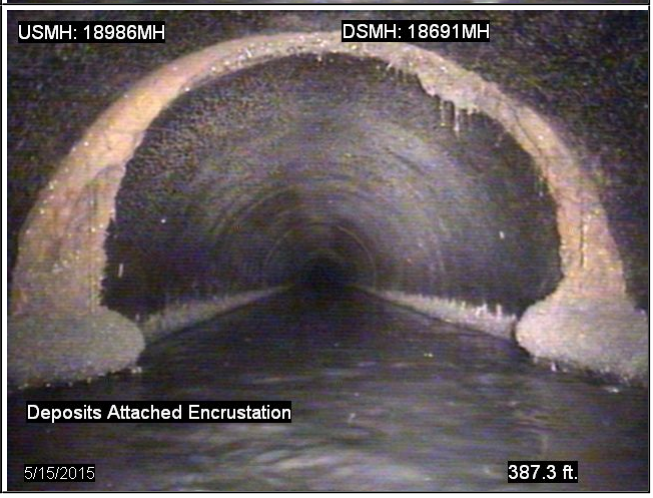
Date: 5/15/2015 9:48:00 AM

Street: 200 Block Woodwinds Dr.
Length Surveyed: 522.6
Pacp Quick Overall Rating: 3127
Height (Diameter): 30
Street: 200 Block Woodwinds Dr.

Pipe Segment Reference: 18986MH_18691MH
Upstream MH: 18986MH
Downstream MH: 18691MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Distance	Fault Observation	Time	Picture
0.0	**Manhole** **Severity: None** **Percent: 0** **Attention Required** **Remarks: 18986MH**	14	
0.0	**Water Level** **Severity: None** **Percent: 20** **Attention Required**	41	
4.9	**Deposits Attached Grease** **Position: 7 To 5** **Severity: None** **Cont Defect: S01** **Percent: 5** **Attention Required** **Remarks: wanders** **Maint Weight: 2**	02:31	

Distance	Fault Observation	Time	Picture
13.8	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	04:12	
28.1	Deposits Settled Other Position: 6 Severity: None Cont Defect: S02 Percent: 5 Attention Required Remarks: under water Maint Weight: 2	05:33	
85.9	Deposits Attached Encrustation Position: 2 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	10:55	

Distance	Fault Observation	Time	Picture
146.2	Deposits Attached Encrustation Position: 7 To 5 Severity: None Percent: 10 Joint Attention Required Maint Weight: 2	15:29	
387.3	Roots Medium Joint Position: 8 To 4 Severity: None Percent: 10 Joint Attention Required Maint Weight: 3	34:20	
387.3	Deposits Attached Encrustation Position: 8 To 4 Severity: None Percent: 5 Joint Attention Required Maint Weight: 2	34:43	

Distance	Fault Observation	Time	Picture
436.2	Deposits Attached Encrustation Position: 8 To 2 Severity: None Percent: 5 Attention Required Maint Weight: 2	40:27	
519.7	Deposits Settled Other Position: 6 Severity: None Cont Defect: F02 Percent: 5 Attention Required Remarks: under water Maint Weight: 2	44:46	
519.9	Deposits Attached Grease Position: 7 To 5 Severity: None Cont Defect: F01 Percent: 5 Attention Required Remarks: wanders Maint Weight: 2	45:05	

Distance	Fault Observation	Time	Picture
522.6	Manhole Severity: None Percent: 0 Attention Required Remarks: 18691MH	46:36	

Created with the POSM report generator

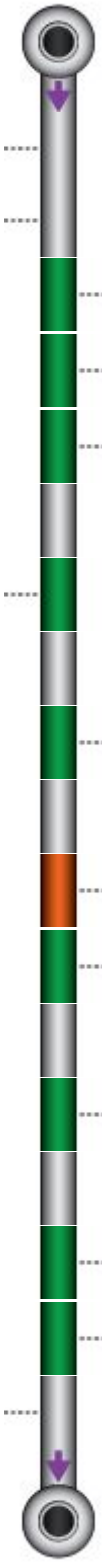
Project: 15-30 Inch Gravity Sewer Assessment

Date: 5/15/2015 9:48:00 AM

Street: 200 Block Woodwinds Dr.
Length Surveyed: 522.6
Pacp Quick Overall Rating: 3127
Height (Diameter): 30
Street: 200 Block Woodwinds Dr.

Pipe Segment Reference: 18986MH_18691MH
Upstream MH: 18986MH
Downstream MH: 18691MH
Direction of Survey: Downstream
Material: Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe



ID Number: 18986MH

(0.0) AMH - Manhole Remark: 18986MH

(0.0) MWL - Water Level

(4.9) DAGS - Deposits Attached Grease - Position: 7 To 5 - Cont Def: S01 Remark: wanders

(13.8) DAE - Deposits Attached Encrustation - Position: 8 To 4

(28.1) DSZ - Deposits Settled Other - Position: 6 - Cont Def: S02 Remark: under water

(85.9) DAE - Deposits Attached Encrustation - Position: 2

(146.2) DAE - Deposits Attached Encrustation - Position: 7 To 5

(387.3) RMJ - Roots Medium Joint - Position: 8 To 4

(387.3) DAE - Deposits Attached Encrustation - Position: 8 To 4

(436.2) DAE - Deposits Attached Encrustation - Position: 8 To 2

(519.7) DSZ - Deposits Settled Other - Position: 6 - Cont Def: F02 Remark: under water

(519.9) DAGS - Deposits Attached Grease - Position: 7 To 5 - Cont Def: F01 Remark: wanders

(522.6) AMH - Manhole Remark: 18691MH

Total Distance: 522.6

ID Number: 18691MH

Nassco C.C.T.V. Defect Code Information

Session Information			
Surveyors Name	HYM_JAK	**Certificate Number**	U-206-2847
System Owner	City of Columbia	**Survey Customer**	City of Columbia
Drainage Area	SR14		
P/O Number	SS7278	**Pipeline Segment Ref**	18986MH_18691MH
Date	5/15/2015	**Time**	09:48
Location	200 Block Woodwinds Dr.		
Locality	Columbia, SC		
Further Location Details: Woods next to river			
Manhole Information			
Upstream Manhole Number: 18986MH			
Rim to Invert	11.6	**Grade to Invert**	9.2
Rim to Grade	2.4		
Downstream Manhole Number: 18691MH			
Rim to Invert	15	**Grade to Invert**	12.6
Rim to Grade	2.4		
Sewer			
Use of Sewer	Sanitary	**Direction**	Downstream
Flow Control	Not Controlled	**Height**	30
Width	30	**Shape**	Circular
Material	Reinforced Concrete Pipe	**Lining Method**	
Pipe Joint Length	13	**Total Length**	522.6
Length Surveyed	522.6	**Year Laid**	
Year Rehabilitated		**Tape/Media Number**	n/a
Purpose	Capital Improvement Program Assessment	**Sewer Category**	
Pre-Cleaning	No Pre-Cleaning	**Date Cleaned**	
Weather	Dry	**Location Code**	Woods
Additional Information	CCTV / easement		

Nassco C.C.T.V. Defect Code Information

Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	3	3
2	0	14	14
1	0	0	0
Overall	0	17	17
Number of Defects	0	8	8
Pipe Rating	0000	3127	3127
Pipe Ratings Index	0	2	2

Nassco C.C.T.V. Defect Code Information

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	14	AMH - Manhole				0			
		18986MH							
0	41	MWL - Water Level				20			
4.9	151	DAGS - Deposits Attached Grease	S01			5		7	5
		wanders							
13.8	252	DAE - Deposits Attached Encrustation				5	X	8	4
28.1	333	DSZ - Deposits Settled Other	S02			5		6	
		under water							
85.9	655	DAE - Deposits Attached Encrustation				5	X	2	
146.2	929	DAE - Deposits Attached Encrustation				10	X	7	5
387.3	2060	RMJ - Roots Medium Joint				10	X	8	4
387.3	2083	DAE - Deposits Attached Encrustation				5	X	8	4
436.2	2427	DAE - Deposits Attached Encrustation				5		8	2
519.7	2686	DSZ - Deposits Settled Other	F02			5		6	
		under water							
519.9	2705	DAGS - Deposits Attached Grease	F01			5		7	5
		wanders							
522.6	2796	AMH - Manhole				0			
		18691MH							

Videos Created for Session 15-30 Inch Gravity Sewer Assessment

18986MH_18691MH_20150515.mpg Size: 600 MB

Additional Reports for Session 15-30 Inch Gravity Sewer Assessment

Created with the  report generator