Request for Bid
Wolf River Interceptor Rehab Addendum # 1 to
RFB No. 194677.71.0397
January 30, 2017

The following information encompasses Addendum #1 for the above referenced RFB. Bidders shall fully consider and acknowledge this Addendum, in the preparation and submittal of its formal Bid. Failure to do so, may result in the rejection of the Bid

Section 1 – Mandatory Pre-Bid Meeting Notes, Bidder Questions and Sign-In Sheet

Section 2 – Updated 00370.3.1 Unit Price Bid Form and 00370.7 Schedule Compliance

Section 3 – Updated Technical Specifications, Drawings, and Special Instructions

Section 4 – RedZone Report

**Please note: Questions submitted via email, not answered in this Addendum; will be addressed in the final Addendum. The final Addendum is scheduled to be issued as needed, on February 2, 2017

Section 1
Meeting Notes, Bidder Questions, and Sign-In Sheet

Q1: Will you allow confined space to be non-permitted?
SARP10: Yes, as long as the program's paperwork has been filled out showing it is not a permit required space.

Q2: Can people enter confined space without being tethered if another retrieval system is in place?
SARP10: Yes, if the hazard assessment paperwork has been completed. This is a case by case decision based on the space and hazards.

Q3: Can you revise the map to include surveyed information?
SARP10: A map with surveyed manholes attached in this Addendum.

Q4: What direction is the flow and how does it continue once it is to the west?
SARP10: The sanitary sewer continues on a west ward path.

Q5: Has there been any preliminary coordination with TDOT to work within their right of way?
SARP10: Communication has been done so far but it is the contractor's responsibility for coordination and SARP10 will assist where necessary.

Q6: What is the appropriate method for performance testing?
SARP10: Refer to Technical Specifications.

Q7: Is the warranty for 5 or 10 years?
SARP10: The warranty is for 5 years. The Technical Specifications have been updated, and are included in this Addendum.

Q8: Are there any concerns about being able to work in the pipe, once it is coated; such as abrasion or high-pressure jetting?
SARP10: There are no concerns at this time.

Q9: Is there a CCTV video available?
SARP10: The video is available at the SARP10 program office, 3485 Poplar Ave Suite 230, Memphis, TN 38111.

Q10: Are there as-built drawings available and will they be available?
SARP10: They are included in this Addendum.

Q11: Do the as-built drawings include slopes and grades?
SARP10: Yes, see question 10.

Q12: You detailed a bypass junction structure in the RFB. Is it required to install that, or can a different structure be installed instead?
SARP10: A bypass suction structure is not required. If the bidder has a better plan to provide the bypass we are open to this idea. The bypass plan must be approved by SARP10 prior to installation.

Q13: Is the bypass plan contractor specific?
SARP10: The bidder is to design a bypass plan for this project. This plan must be approved by SARP10 prior to installation.

Q14: Will a flow rate be published that bypass should be designed for?
SARP10: Specification section 09920 – Interceptor Coating, Part 3.01, Section E has been changed to clarify the bypass flow requirements.

Q15: Is there a lot of debris in the bottom of the pipe?
SARP10: Based on the CCTV, it does not appear to have significant debris. All information provided is done so as a courtesy and it is the contractor's responsibility. The RedZone report is included with this Addendum.

Q16: Is the flow monitoring data available to the contractor?
SARP10: No.

Q17: Is the work done at the plant downstream?
SARP10: Yes.

Q18: What is the elevation of water SARP10 wants the CIPP to be designed for?
SARP10: CIPP should be designed to a water depth of 45-feet.

Q19: In July of 2015 when the Wolf River flooded, did this easement flood?
SARP10: No.

Q20: Is greater than 100% flow capacity required for all rehab options? It is only listed in CIPP.
SARP10: This question will be answered in Addendum 2.

Q21: Is there a minimum ID required to meet flow characteristics?
SARP10: This question will be answered in Addendum 2.

Q22: Is there any hydraulic data on the box culverts that bypass can be routed through?
SARP10: Not at this time.

Q23: Who owns the drainage structures that bypass would be routed through?
SARP10: TDOT.

SIGN-IN SHEET

Project:	SARP10	**Meeting Date:**	January 24, 2017
Meeting:	Wolf River Interceptor Rehabilitation	**Time:**	9:30 AM – 11:00 AM
Facilitator:	Josh Grabowski	**Place/Room:**	Ben Hooks Library

Name	Company	Phone	E-Mail
Mick Hanson	ACE Pipe	816-912-6126	mhanson@acepipe.com
Jordan Wisener	Quadex	(501) 690-2752	jwisener@quadexonline.com
Troy Leed	CTR	317-710-2144	
Charlotte Reed	CTR	317-797-7214	charlotte@ctrcoatings.com
Justin Avant	SARP10	901-849-6554	justin_avant@gsdnet.com
Cain Maynard	Sunbelt Rentals Pump & Power	615-838-2854	cain.maynard@sunbeltrentals.com
TYRELL FORDE	AWPM	901-297-8724	tforde@allworldmail.com
Rich Schici	IPR	404-308-8263	rschici@teamipr.com
BRAD DAVIS	BTU	(901) 378-7203	davisbj@bv.com
BOB CAPKOVIC	JPG FLOWTITE	901-647-4371	RCAPKOVIC@FLOWTITEPIPE.COM
Gary Alder	OCI	813-323-0502	aldergs@bv.com
Riley Thompson	OCI	6063591972	ThompsonLR@bv.com

SIGN-IN SHEET

Project:	SARP10	**Meeting Date:**	January 24, 2017
Meeting:	Wolf River Interceptor Rehabilitation	**Time:**	9:30 AM – 11:00 AM
Facilitator:	Josh Grabowski	**Place/Room:**	Ben Hooks Library

Name	Company	Phone	E-Mail
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Stan Henning	Quality Liner Systems	281 615 8201	shenning@gleadersonline.com
DAN SWIDERAK	SAK Construction	636 385 1039	dswiderak@sak-con.com
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James Hinte	MAGNOLIA UNDER.	901.238.7985	JHINTE@MAGNOLIAUNDERGROUND.US
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BJ Kerstiens	Insituform	704-564-4020	bkerstiens@aegion.com
M Leonard	Xylem	662-420-9797	Michael.Leonard@xyleminc.com
Ron Wilson	SYNERGETIC	205-920-7374	rwilson@sesinc.us
Josh Grabowski	Rehrig Pacific	870-514-1716	Josh.Grabowski@rpcsc.net
Jason Burton	Memphis Road Boring	901-755-3700	jason@wcamemphis.com

SIGN-IN SHEET

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NAME	COMPANY	PHONE	E-MAIL
Mick Hanson	Ace Pipe	816-912-6126	mhanson@acepipe.com
Jordan Wisener	Quadex	501-690-2752	jwisener@quadexonline.com
Troy Reed	CTR	317-710-2144	
Charlotte Reed	CTR	317-797-7214	charlotte@ctrcoatings.com
Justin Avent	Gresham Smith(SARP10)	901-849-6554	justin_avent@gspnet.com
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Bob Capkovic	TPG Flowtite	901-647-4371	rcapkovic@thompsonpipegroup.com
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Heath Nelson	Video Industrial Services	205-834-2979	hnelson@videoindustrial.com
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James Hinte	Magnolia Underground	901-238-7985	jhinte@magnoliaunderground.us
Joe Collins	OCI	731-616-8922	collinsjj@bv.com
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Tony McDougle	Proshot Concrete	256-627-0044	tony@proshotconcrete.com
Jake Crowe	IPR	803-206-2444	jcrowe@teamipr.com
Michael Gates	Xylem, Inc.	901-481-1543	mgates@xyleminc.com
Scot O'Bryan	Sunbelt Rentals	843-514-4870	scot.obryan@sunbeltrentals.com
BJ Kershens	Insituform	704-564-4020	wkershens@aegion.com
M. Leonard	Xylem	662-420-9797	michael.leonard@xyleminc.com
Ron Wilson	Synergetic	205-960-7374	rwilson@sesinc.us
Josh Grabowski	RohadFox	870-514-1719	josh.grabowski@rccsc.net
Jason Burton	Memphis Road Boring	901-755-3700	jason@wcamemphis.com

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Section 2
Updated 00370.3.1 Unit Price Bid Form and 00370.7 Schedule Compliance

Table 00370.3.1 - Unit Price Bid Form

Bidder should refer to Section 00270, Instructions to Bidders, when completing this Bid Form. Bidder shall complete this form entirely and return it with Bidder's Bid.

Submitted by: (Company Name)

00370.3 Bid Pricing Information

00370.3.1 Unit Pricing

Bidder proposes to complete the RFB Work based on firm, fixed, unit prices (US dollars), which prices multiplied by the final Work quantities would represent the full consideration to Bidder for its complete and satisfactory performance of the Work in compliance with all the terms and conditions of the RFB Documents. The Unit Prices in this Table include the cost of all the work which is required or implied by the RFB documents or which may be inferred therefrom, and which is customarily provided in furnishing a complete and finished work item of its kind. Further, any and all alterations, modifications, and adjustments to the work item, which is reasonably foreseeable or customarily encountered in providing and installing equipment, material, and services of the work item kind, will be performed without additional compensation.

In the event of a Purchaser-approved change in the scope of Work for which a unit price from this Table is not applicable, as determined by the Purchaser, the Subcontractor shall provide a new unit price for review and acceptance by the Purchaser. Subcontractor shall provide all information requested by the Purchaser to substantiate the value of the new unit price.

00370.3.1.1 Unit Prices				Bidder Response Columns	
Item Number	**Item Description**	**Unit of Measure**	**Estimated Quantity**	**Unit Price**	**Extension Price**
Wolf River Interceptor Rehab (Option A) CIPP					
Manholes					
00001-6.01	GPS Coordinates of Manhole Cover	Each	2	$ -	$ -
00001-6.02	Manhole Assessment and Certification Program (MACP) Level 2 Inspection - with 3D Scan	Each	2	$ -	$ -
00001-6.03	Removal of All Manhole Steps	Each	20	$ -	$ -
Lining / Coating Options					
09910-7.01.1	CIPP 96-INCH	LF	1,350	$ -	$ -
09910-7.02.1	Bypass Pumping for CIPP	LS	1	$ -	$ -
09910-7.03	Manhole Modification	Each	2	$ -	$ -
09920-6.04	Site Preparation and Restoration	LS	1	$ -	$ -
09920-6.07	Heavy Cleaning 96-inch Pipe	LF	1,350	$ -	$ -
9930.01	Special Structure for Bypass	LS	1	$ -	$ -
Sonar / CCTV Inspection					
00004-6.01	Post CCTV Inspection	LF	1,350	$ -	$ -
Miscellaneous					
9931.01	SRF Signage	Lot	1	$ -	$ -
	100% Performance and Payment Bonds	Lot	1	$ -	$ -
	Wolf River Interceptor Rehab (Option A)- Total Estimated Unit Price Value				$ -

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00370.3.1.1 Unit Prices				Bidder Response Columns	
Item Number	**Item Description**	**Unit of Measure**	**Estimated Quantity**	**Unit Price**	**Extension Price**
Wolf River Interceptor Rehab (Option B) Geopolymer / Cementitous Coating					
Manholes					
00001-6.01	GPS Coordinates of Manhole Cover	Each	2	$ -	$ -
00001-6.02	Manhole Assessment and Certification Program (MACP) Level 2 Inspection - with 3D Scan	Each	2	$ -	$ -
00001-6.03	Removal of All Manhole Steps	Each	20	$ -	$ -
Lining / Coating Options					
09920-6.01.2	Geopolymer	LF	1,350	$ -	$ -
09920-6.02.2	Bypass Pumping for Geopolymer	LS	1	$ -	$ -
09920-6.04	Site Preparation and Restoration	Each	1	$ -	$ -
09920-6.06	Additional Leak Stop Grouting	HR	50	$ -	$ -
09920-6.07	Heavy Cleaning 96-inch Pipe	LF	1,350	$ -	$ -
9930.01	Special Structure for Bypass	LS	1	$ -	$ -
Sonar / CCTV Inspection					
00004-6.01	Post CCTV Inspection	LF	1,350	$ -	$ -
Miscellaneous					
9931.01	SRF Signage	Lot	1	$ -	$ -
	100% Performance and Payment Bonds	Lot	1	$ -	$ -
	Wolf River Interceptor Rehab (Option B)- Total Estimated Unit Price Value				$ -

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00370.3.1 Unit Pricing

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00370.3.1.1 Unit Prices				Bidder Response Columns	
Item Number	**Item Description**	**Unit of Measure**	**Estimated Quantity**	**Unit Price**	**Extension Price**
Wolf River Interceptor Rehab (Option C) Epoxy Coating					
Manholes					
00001-6.01	GPS Coordinates of Manhole Cover	Each	2	$ -	$ -
00001-6.02	Manhole Assessment and Certification Program (MACP) Level 2 Inspection - with 3D Scan	Each	2	$ -	$ -
00001-6.03	Removal of All Manhole Steps	Each	20	$ -	$ -
Lining / Coating Options					
09920-6.01.3	Epoxy	LF	1,350	$ -	$ -
09920-6.02.3	Bypass Pumping for Epoxy	LS	1	$ -	$ -
09920-6.04	Site Preparation and Restoration	LS	1	$ -	$ -
09920-6.06	Additional Leak Stop Grouting	HR	50	$ -	$ -
09920-6.07	Heavy Cleaning 96-inch Pipe	LF	1,350	$ -	$ -
9930.01	Special Structure for Bypass	LS	1	$ -	$ -
Sonar / CCTV Inspection					
00004-6.01	Post CCTV Inspection	LF	1,350	$ -	$ -
Miscellaneous					
9931.01	SRF Signage	Lot	1	$ -	$ -
	100% Performance and Payment Bonds	Lot	1	$ -	$ -
	Wolf River Interceptor Rehab (Option C)- Total Estimated Unit Price Value				$ -

Table 00370.3.1 - Unit Price Bid Form

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Submitted by: (Company Name)

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00370.3.1 Unit Pricing

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In the event of a Purchaser-approved change in the scope of Work for which a unit price from this Table is not applicable, as determined by the Purchaser, the Subcontractor shall provide a new unit price for review and acceptance by the Purchaser. Subcontractor shall provide all information requested by the Purchaser to substantiate the value of the new unit price.

00370.3.1.1 Unit Prices				Bidder Response Columns	
Item Number	**Item Description**	**Unit of Measure**	**Estimated Quantity**	**Unit Price**	**Extension Price**
Wolf River Interceptor Rehab (Option D) Polyurethane Coating					
Manholes					
00001-6.01	GPS Coordinates of Manhole Cover	Each	2	$ -	$ -
00001-6.02	Manhole Assessment and Certification Program (MACP) Level 2 Inspection - with 3D Scan	Each	2	$ -	$ -
00001-6.03	Removal of All Manhole Steps	Each	20	$ -	$ -
Lining / Coating Options					
09920-6.01.4	Polyurethane	LF	1,350	$ -	$ -
09920-6.02.4	Bypass Pumping for Polyurethane	LS	1	$ -	$ -
09920-6.04	Site Preparation and Restoration	LS	1	$ -	$ -
09920-6.06	Additional Leak Stop Grouting	HR	50	$ -	$ -
09920-6.07	Heavy Cleaning 96-inch Pipe	LF	1,350	$ -	$ -
9930.01	Special Structure for Bypass	LS	1	$ -	$ -
Sonar / CCTV Inspection					
00004-6.01	Post CCTV Inspection	LF	1,350	$ -	$ -
Lining / Coating Options					
9931.01	SRF Signage	Lot	1	$ -	$ -
	100% Performance and Payment Bonds	Lot	1	$ -	$ -
Wolf River Interceptor Rehab (Option D)- Total Estimated Unit Price Value					$ -

00370.7 Schedule Compliance
State any exceptions in 00370.6.1.

00370.7.1 Construction Milestone Completion Dates and Applicable Liquidated Damages				
Item	**Milestone Description**	**Construction Milestone Completion Date**	***LDs Apply?**	**Bidder Complies? (Yes/No)**
1	Completion of all Work under Subcontract 71.0397	~~240~~ 180 calendar days after Notice to Proceed	Yes	
*LD indicates that completion of the Work after the "Construction Milestone Completion Date" is subject to liquidated damages per applicable Articles of Section 00571.				
*Note Subcontractor performance will directly impact future procurements for the SARP10 Program, schedule is critical and must be maintained.				

Section 3
Updated Technical Specifications, Drawings, and Special Instructions

applicator found to be not qualified shall (at the written request of the Purchaser) be removed forthwith by the Subcontractor.

10. The COATINGS MANUFACTURER shall warranty the entire project to include any and all aspects of the surface preparation, base material installation and protective coating applications for a period of FIVE (5) YEARS from the date of acceptance by the Purchaser. The warranty shall make no distinction between installation practices and material performance and shall not be prorated with respect to elapsed time for the entire warranty period. Manufacturer shall, within a reasonable period of time after receipt of written notice thereof by the Purchaser [period not to exceed sixty (60) calendar days], repair defects in materials or workmanship during said FIVE (5) year period, and any damage to other work caused by such defects or repairing of same at his own expense and without cost to the Purchaser.

B. Interceptor Coating System. Spray applied or centrifugally cast interceptor coating system:

1. The material applied onto the surface of the interceptors shall be a coating system consisting of a base coat and top coat to provide corrosion resistance within a sanitary sewer environment. The thickness of the base coat and top coat shall meet the manufacturer's recommendation. Subcontractor can request to not use a base coat but must provide to the Owner and Purchaser evidence of successful installations of the product without using a base coat and its capability to properly adhere to the interceptor wall and form a smooth finish on the wall.

2. The top coat applied shall be an approved polymer based polyurethane, a geopolymer, or a high-build solvent free epoxy product in conjunction with a high-strength cementitious repair/patch/base coat. The following products are acceptable and approved: Spectrashield Liner Systems, Quadex QM-1s and Structure Guard, GeoKrete Geopolymer by Quadex, EcoCast by IPR, 4553 Epoxy Coating and Maximum CA Plus Cement, Geocast by Standard Cement and Centripipe/Conshield by APM Permaform

3. The installer shall warrant and save harmless the Owner and his Purchaser against all claims for patent infringement and any loss thereof. The Subcontractor shall handle and store all material and shall dispose of all wastes in accordance with applicable regulations.

4. Each system shall be designed for application over damp (but not active running water) surfaces without degradation of the final product and the bond between the product and the interceptor surfaces. Active leaks shall be stopped using a premixed fast-setting, volume-stable waterproof cement plug consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents. It shall not contain chlorides, gypsum, plasters, iron particles, aluminum powder or gas-forming agents, or promote corrosion of steel it may come in contact with. Set time shall be approximately 1 minute. Ten-minute compressive strength shall be approximately 500 PSI.

C. Mortar

1. Mortar shall be composed of one part Portland cement and two parts sand (volumetric measure) thoroughly mixed in a tight box, with water added gradually and mixed continually until mortar has attained the proper consistency for use in brick

masonry; prepared only in such quantities as needed for immediate use; mortar mixed for more than 30 minutes, re-tempered, or previously set will not be allowed.

2.02 EQUIPMENT

A. The Subcontractor will furnish and maintain in good condition all equipment and facilities as required for the proper execution and inspection of the Work. All equipment and facilities will be on site and approved by the Purchaser before work will be permitted to begin.

PART 3 – CONSTRUCTION REQUIREMENTS

3.01 PRELIMINARY AND GENERAL ITEMS

A. Traffic Control

1. All traffic control shall be installed and maintained in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). On roads with heavy traffic volume, a flagman may also be needed to assist with traffic control.

B. Fall Protection

1. Subcontractor shall install and maintain all fall protection measures in accordance with the SARP10 Loss Control Manual. The Subcontractor shall construct a controlled access zone around the interceptor being adjusted. At a minimum, the fall protection zone shall include traffic cones encircled with pennant tape. The controlled access zone must have one point of access with an entrance log.

C. Cleaning

1. Sewers shall be cleaned of all debris, roots and other materials that would block proper installation of coating. Inspection of the sewer pipe shall be performed by the Subcontractor's experienced personnel trained in location breaks and obstacles by CCTV inspection and certified under National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP®). Utilizing a color video inspection system with data recording capabilities, the entire pipe section to be lined shall be inspected in accordance with the CCTV specifications. The interior of the pipe shall be carefully inspected to determine the location of any conditions, which may prevent the proper installation of the coating, and it shall be noted so that these conditions can be corrected. The video inspection shall be performed in the presence of the Purchaser's Resident Project Representative.

2. Utilizing high-pressure jet cleaning equipment, several passes shall be completed to assure that all debris is removed from the pipe. If roots are present, root cutters or mechanical brushes shall be attached to the jet nozzle and sent through the line to remove all root intrusions. Should equipment other than that described above be needed to remove debris or heavy roots, additional payment may be authorized by the Purchaser.

D. Flow Control:

1. The Subcontractor shall be responsible for plugging or diverting the flow of sewage as needed for repair and coating of interceptor.

E. Bypass of Flow:

1. As required for acceptable completion of the work and/or to avoid damages due to sewer spills or overflows, the Subcontractor shall provide for sewer flow maintenance around the interceptors designated for rehabilitation. The bypass shall typically be made by plugging the line at an existing upstream interceptor and pumping the flow into a downstream interceptor or adjacent sanitary sewer system. The pump and bypass lines shall be of adequate capacity and size to handle full pipe gravity flow as determined by Manning's equation. Bypassing of sanitary sewage into the storm water system will not be allowed. For all bypass pumping, pump noise shall be kept to a minimum to the satisfaction of the Purchaser. The Subcontractor shall be required to contact all residential and commercial customers whose service lines connect to the sewer main being bypassed and inform them that they will be temporarily out of service. The Subcontractor shall also advise those customers against water usage until the mainline is back in service. After completing the necessary work on the main line, the Subcontractor shall advise those customers that the sewer main is back in service.

2. Bypass pumping is defined as providing pumps, standby pumps, piping, elevated structural support for aerial crossings, manpower to operate, routine maintenance and repair capability, pipe plugs, fuel, route and pump site clearing and any other work necessary to provide a complete bypass pumping operation. Any structures proposed by the Subcontractor for construction over or penetration into the interceptor piping for the purpose of performing the bypass operations must be approved by the Purchaser prior to implementation. The Subcontractor shall submit design drawings and details that are signed and sealed by a professional engineer licensed in the State of Tennessee. All bypass pump schemes must be submitted to and approved by the Purchaser in advance.

F. Wastewater Spills

1. Should the Subcontractor spill any wastewater, such that the sewage either immediately or ultimately enters the waters of the State of Tennessee, then the Subcontractor will be completely responsible for any fines or penalties imposed on the Purchaser or the Subcontractor by the USEPA or the State of Tennessee.

2. Public advisory services will be required to notify all parties whose service laterals will be out of service and to advise against water usage until the mainline is back in service.

3. The Subcontractor will be required to provide businesses with temporary service, as needed, and will be responsible for all necessary bypass pumping flows.

G. Safety

1. The Subcontractor shall carry out his operations in strict accordance with all applicable OSHA and SARP10 standards. Particular attention is drawn to those safety requirements involving work on an elevated platform and entry into a confined space.

3.02 INTERCEPTOR REHABILITATION – PROTECTIVE COATING SYSTEM

MISCELLANEOUS CONTRUCTION REQUIREMENTS

1. SCOPE OF THE CONTRACT:

1. The Scope of work for this bid generally consist of installing cured in place pipe (CIPP) or coating system on approximately 1,350 feet of 96-inch diameter sewer main located near the intersection of I-40 and Hwy 51. Other related work will include bypass pumping, restoring the disturbed area, and installing special suction structure for bypass.
2. The Contract is for one of four total options to be bid. Bidder may choose to bid on any number of options at Bidder's discretion. If not bidding on an option shown, leave all unit prices blank.

2. ADDITIONS TO TECHNICAL SPECIFICATIONS:

A. In the event of conflict between the technical specifications, Construction Drawings, the General Provisions, or Special Conditions contained herein, and/or product manufacturer's specifications, the more stringent specs shall apply. However, all conflicts shall be brought to the attention of the Purchaser for approval.

B. The cost of all required material inspections and testing, including, but not limited to earthwork and concrete testing, shall by paid for by the subcontractor.

C. Item No. 09930.01, Special Structure for Bypass

1. This item is not specified in the technical specifications.
2. This item includes all labor, materials and design cost to install Special Structure for Bypass.
3. SARP10 will allow the installation of a permanent manhole structure to aid with the bypass and be left when the job is complete. The design of this structure shall be approved by SARP10 prior to installation.
4. Payment will be at the contract unit price lump sum.

D. Item No. 09931.01 SRF Signage

1. This item is not specified in the technical specifications.
2. This item includes all labor, materials and design cost to install the required SRF Signage.
3. The required sign specs were included in the RFB, and are attached in this Addendum.

CLEAN WATER STATE REVOLVING FUND

IDENTIFICATION SIGN

All plans and specifications for each project approved shall contain provisions for requiring the general contractor to provide identification signs. The signs shall conform to the following basic features:

1. The following diagram shall be used as a design:

CLEAN WATER FOR TENNESSEE

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

GOVERNOR
BILL HASLAM

COMMISSIONER
BOB MARTINEAU

CITY OF

MAYOR

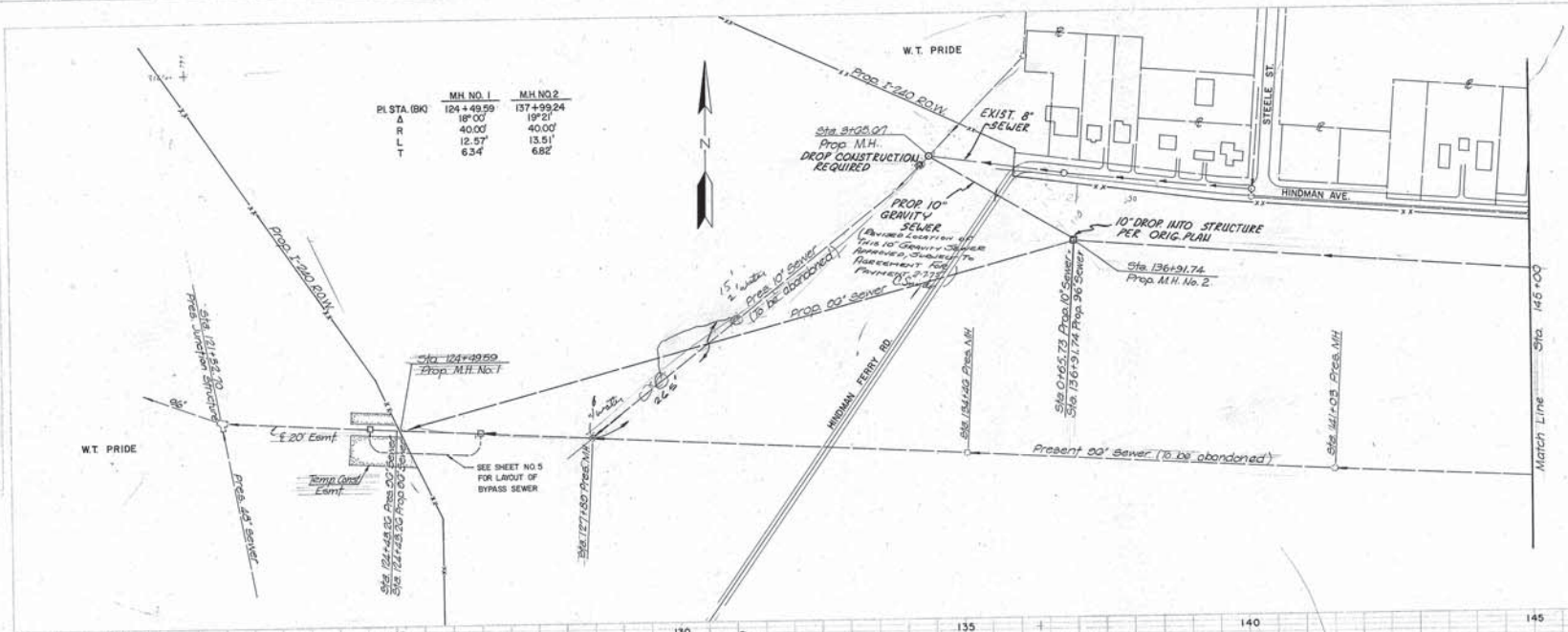
STATE REVOLVING FUND PROJECT

CWSRF LOAN . . . $ _____

2. The sign shall be a 4'0" X 8'0" sheet of exterior grade plywood and shall be built so as to remain erected during the entire construction phase of the project.

3. The background of both sides shall be white. The lettering shall be black and shall be large enough to take advantage of the full size of the plywood. The stars shall be white set on a blue field and surrounded by a white ring placed inside a state map in red with a stripe of white and blue on the right side. The sign shall be bordered by a one-inch blue stripe.

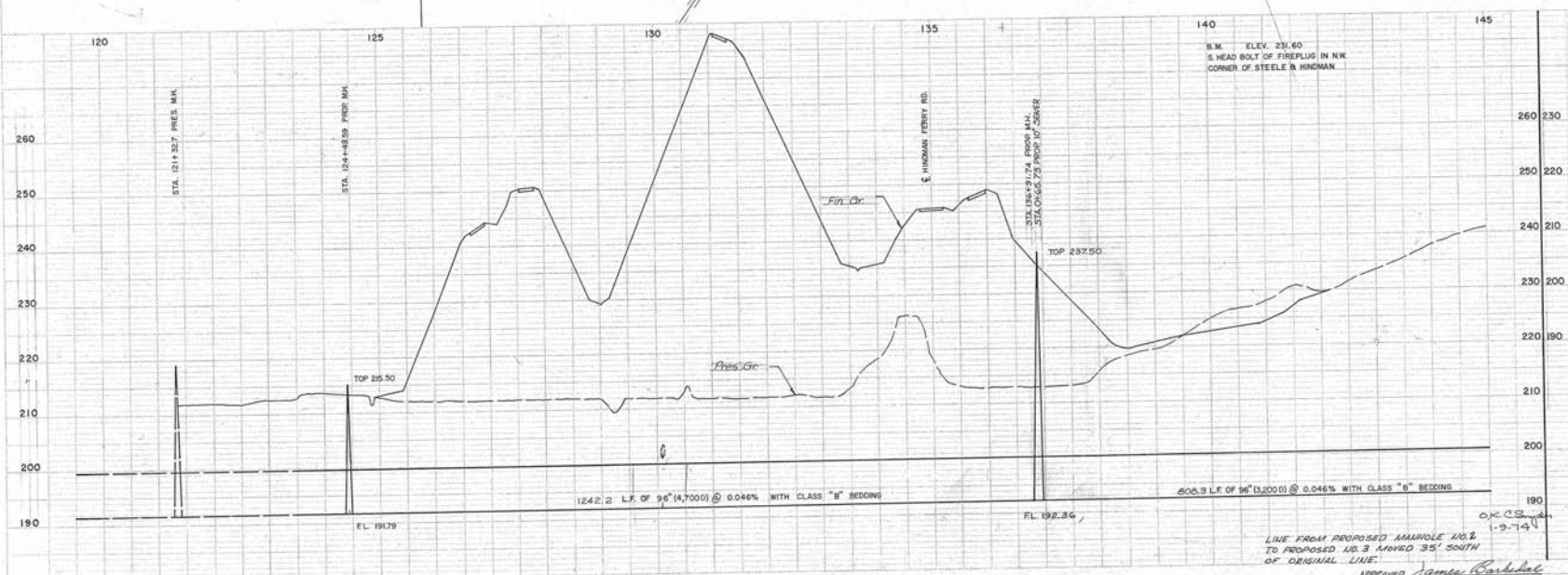
Revised: JANUARY 20, 2011

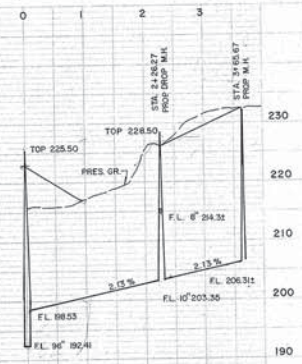


PI STA. (BK)	M.H. NO. 1	M.H. NO. 2
	124+49.59	137+99.24
Δ	18°00'	19°21'
R	40.00'	40.00'
L	12.57'	13.51'
T	6.34'	6.82'

NOTES

1. See Sheet Nos. 8 & 9 for details of 96" Sewer Manholes.
2. See Sheet Nos. 9 & 10 for pipe bedding details.
3. The contractor's attention is called to the requirement that Hindman Avenue must remain open to vehicular traffic at all times for the duration of construction.





PROPOSED 10" SEWER

As Built 1-10-55

Book 7944

LINE FROM PROPOSED MANHOLE NO. 2 TO PROPOSED NO. 3 MOVED 35' SOUTH OF ORIGINAL LINE.

Approved James Barksdale

O.K. C.S. Snyder 1-9-74

PROPOSED LAYOUT

DEPARTMENT OF PUBLIC WORKS
WOLF RIVER SEWER DISTRICT
METROPOLITAN SANITARY SEWER SYSTEM

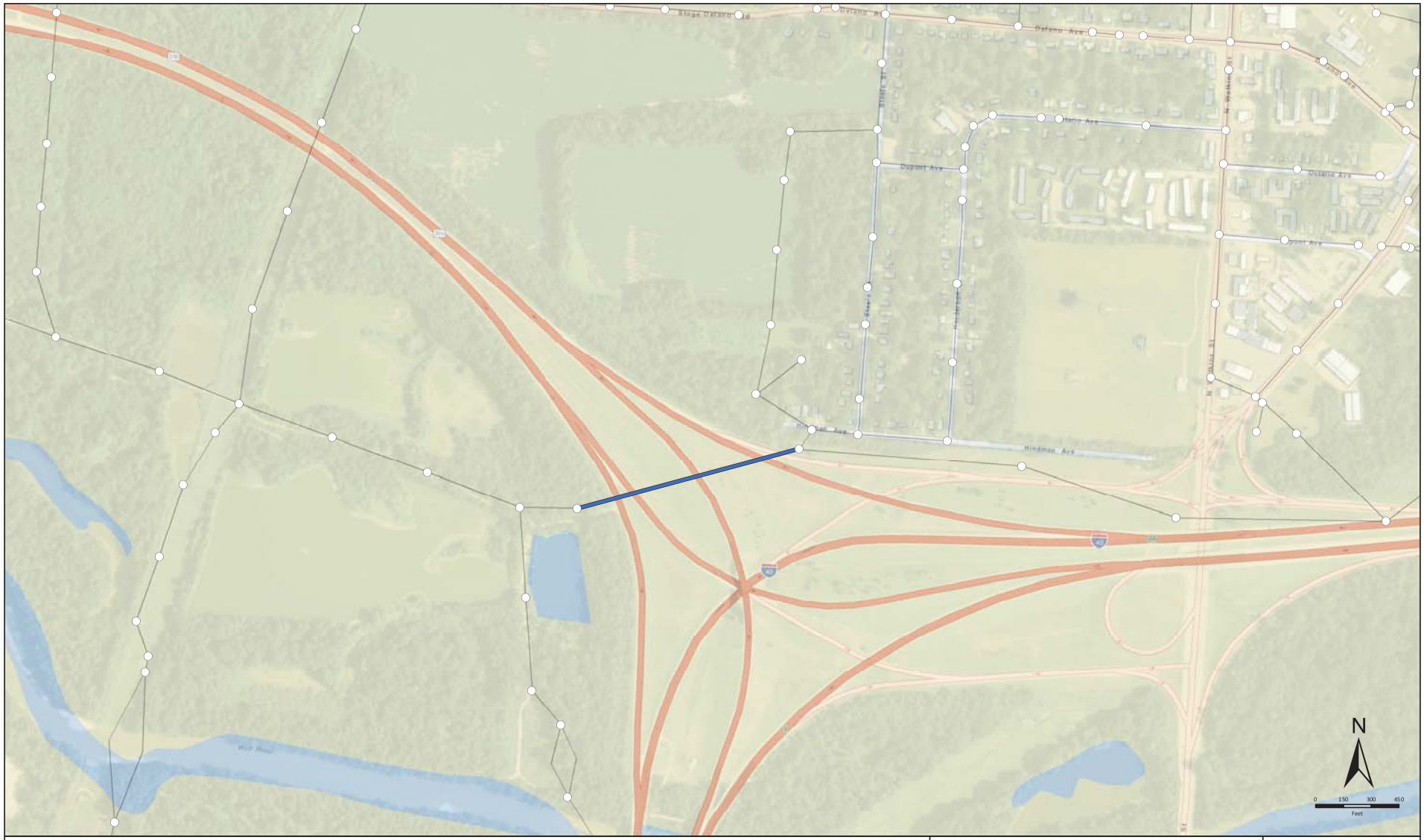
WOLF RIVER INTERCEPTOR

MEMPHIS, TENN.

SURVEY BY: NOV. 1973 BOOK
DRAWN BY: NOV. 1973 SCALE: 1" = 100' H & 10' V
APPROVED

James Barksdale — OFFICE ENGINEER
CITY ENGINEER

BOOK NO.	PAGE NO.	SHEET NO.
WD1	87	9



Legend

Segment to be Rehabilitated

Sanitary Manhole (No Rehab)

Gravity Main (No Rehab)

WOLF RIVER 96" REHABILITATION

Date Generated: 1/25/2017

BLACK & VEATCH
Building a world of difference.

Section 4
RedZone Report

RedZone® ROBOTICS

Responder Multi-Sensor Inspection

TN Memphis 96-Inch Interceptor Sewer - Sonar/CCTV Inspection

21-19
U/S MH: 21
D/S MH: 19
RECORD DRAWING DIAMETER (RCD): 96 in
Job: SJ501079
Inspection Date: 11/6/2012

RedZone Robotics, Inc
91 43rd Street, Suite 250
Pittsburgh PA 15201
Phone 412.476.8980
Fax 412.476.8981
www.redzone.com

Table of Contents

1 Summary

1.1 Job

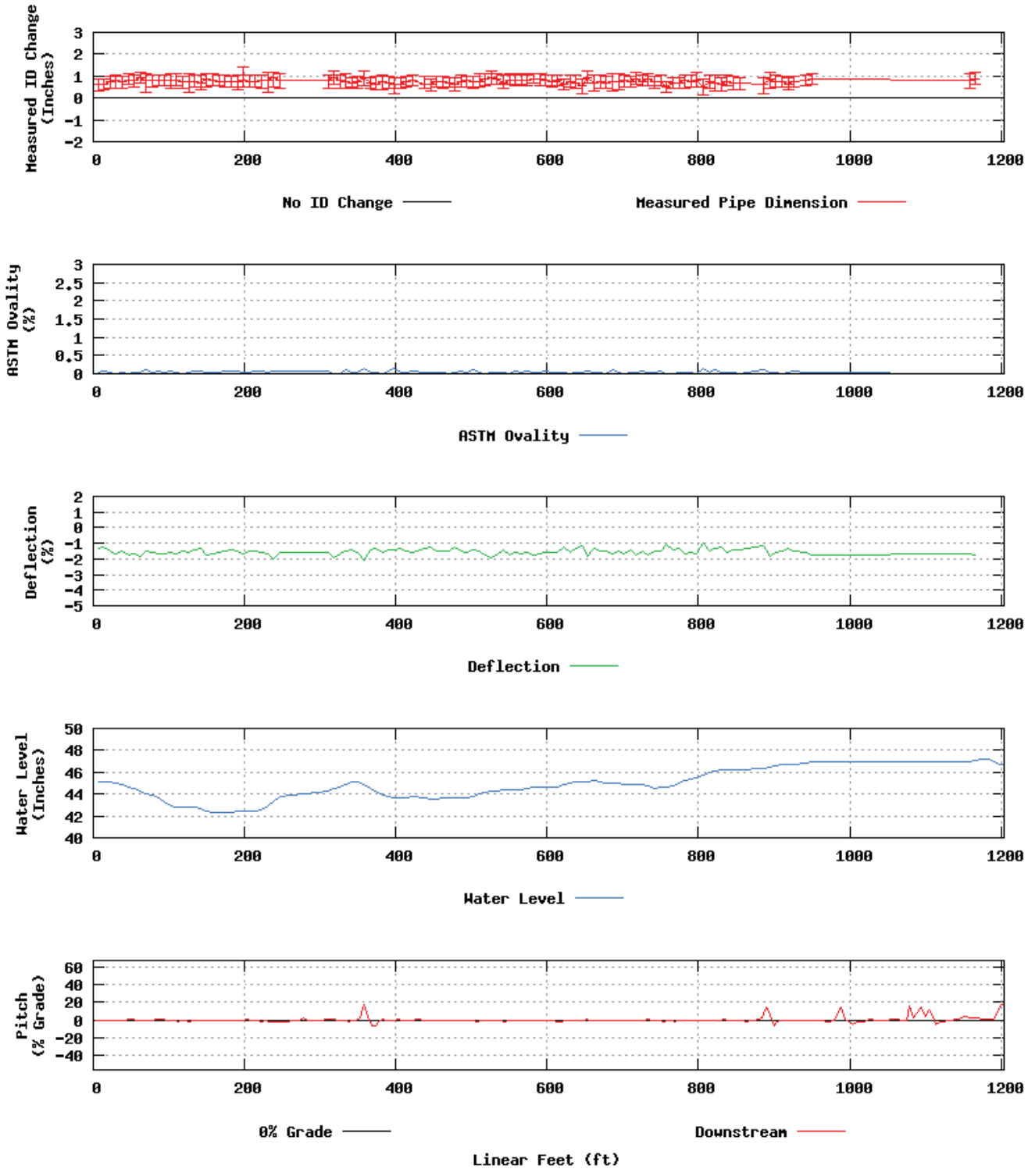
Prepared For	Memphis
Street Location	North Watkins Street on Ramp to I40 Easement
Deployment Location / Manhole	21
Operator	J. Williamson
Deployment Weather	Dry
Planned Inspection Distance	1300 ft
Actual Inspection Distance	1204 ft
Inspection Direction	Downstream
Upstream Location / Manhole	21
Downstream Location / Manhole	19
Record Drawing Diameter	96 in
Record Drawing Pipe Shape	Circular
Pipe Material	Reinforced Concrete

1.2 Results

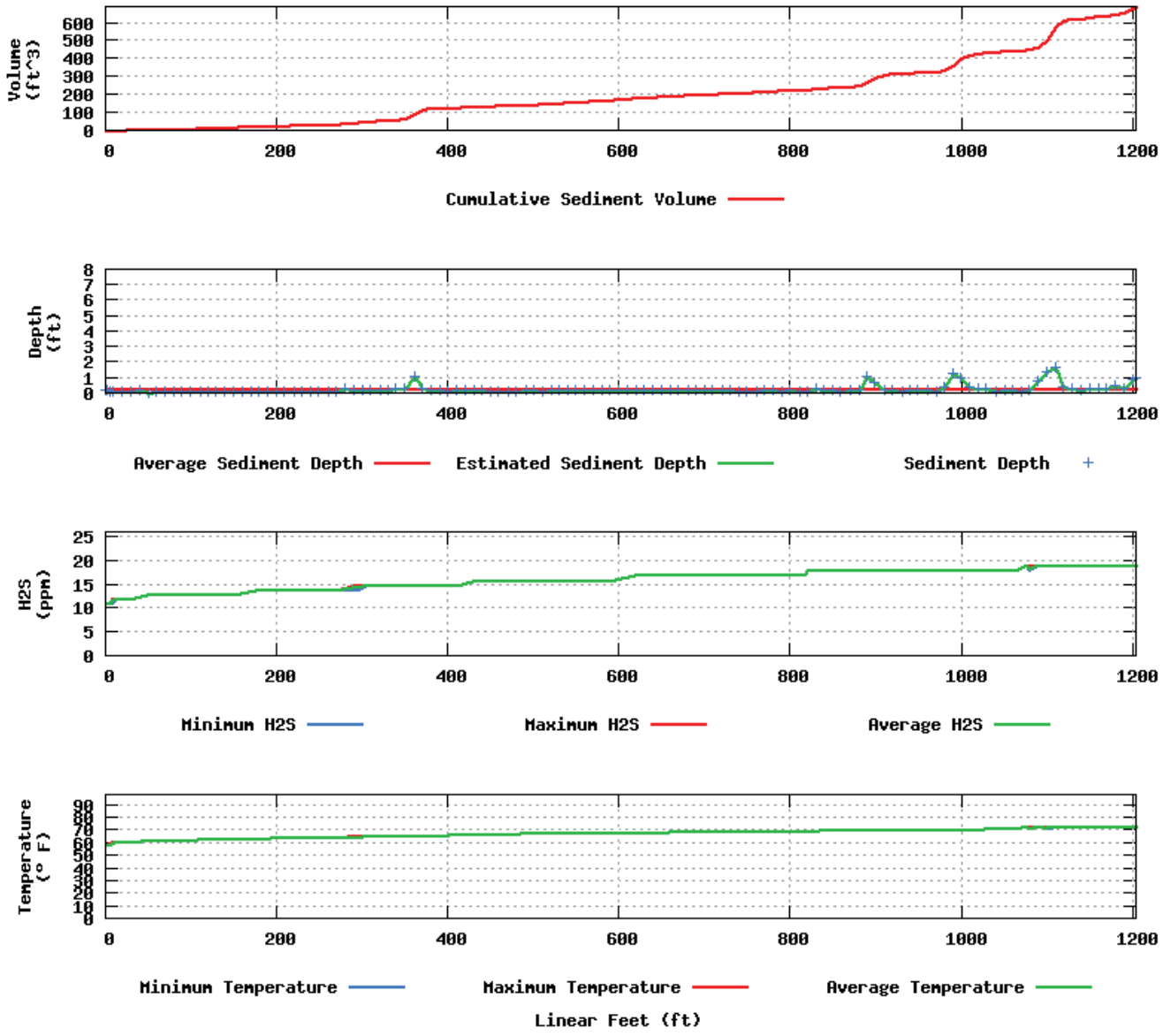
Observations	
Number of Observations	21
Number of Grade 4 & 5 Observations	12
Number of Continuous Observations	1
Flow Height	40 %
Ovality and Deflection	
Average ASTM Ovality	0.05 %
Minimum ASTM Ovality	0.00 %
Maximum ASTM Ovality	0.16 %
Average Deflection	-1.54 %
Minimum Deflection	-2.06 %
Maximum Deflection	-0.95 %
Ovality Calculation Method	Half-Pipe
Sediment	
Average Sediment Depth	3.4 in
Total Sediment Volume	688.4 ft^3
% of Pipe Flow Restriction Due to Sediment	1.1 %
Gas	
Inspected Distance with Average H2S Concentration Over 2 ppm	1204.0 ft
% Inspected Distance with Average H2S Concentration over 2ppm	100.0 %
Average Concentration of H2S	16.3 ppm
Maximum Concentration of H2S	19 ppm
Average Temperature	68 degrees F
Maximum Temperature	73 degrees F
Corrosion and Buildup	
Number of Precision Scans	113
Average Measured Internal Pipe Dimensions	97.51 in
Average Measured ID Change in Precision Scans (radial)	0.76 in
Minimum Measured ID Change in Precision Scans (radial)	0.11 in
Maximum Measured ID Change in Precision Scans (radial)	1.39 in

1.3 Segment Summary View

The inspected distance displayed below is the distance downstream from the 21 manhole.



The inspected distance displayed below is the distance downstream from the 21 manhole.



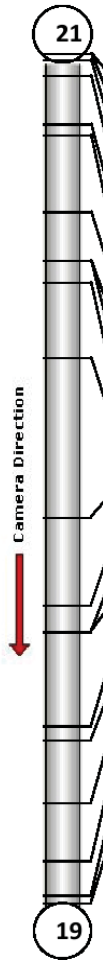
2 Observations

Profile/Photo Observation Report

Date:	**11/06/2012**	Weather:	**Dry**	Sheet #:	**0**
Pipe Length:		Owner:	**Memphis**	Pre Clean:	
P.O.#:		Surveyor:	**J. Williamson**	PSR:	
Customer:	**City of Memphis**	Clean Date:		Shape:	**Circular**

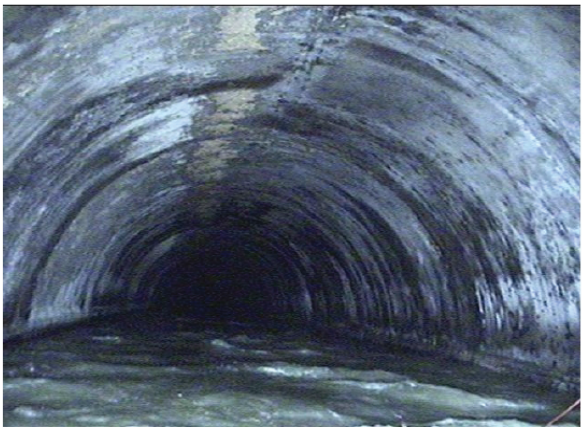
Street:	**Interstate 40 on ramp**	Flow Control:	**Not Controlled**
City:	**Memphis, TN**	Year Renewed:	
Location:	**Easement/Right of Way**	Tape/Media #:	**T1**
Purpose:	**Not Known**	Dia/Height:	**96**
Use:	**Sanitary**	Material:	**Reinforced Concrete Pipe**
Drain Area:	**Wolf River**	Lining:	**Other**
Category		Pipe Joint Length:	
Comment:			
Location Details:		Direction of Survey:	**Downstream**

US MH: **21** DS MH: **19** Total Length Surveyed: **1204.8**



Position	Code	Observation	Counter	Photo	Grade
0	AMH	Manhole	0	0-AMH.jpg	-
0	MWL	Water Level	84	0-MWL.jpg	-
9	SAM	Surface Aggregate Missing	1171	9-SAM.jpg	S4
30.4	SAMC	Surface Aggregate Missing Chem	1335	30.399999618530	S2
99.5	SAM	Surface Aggregate Missing	1600	99.5-SAM.jpg	S4
116.2	SAM	Surface Aggregate Missing	1681	116.2-SAM.jpg	S4
224.8	SAM	Surface Aggregate Missing	1985	224.8-SAM.jpg	S4
293.8	CH2	Crack Longitudinal Hinge, 2	2197	293.8-CH2.jpg	-
293.8	SAM	Surface Aggregate Missing	2243	293.8-SAM.jpg	S4
325.2	SAM	Surface Aggregate Missing	2345	325.2-SAM.jpg	S4
431.2	SAM	Surface Aggregate Missing	2645	431.2-SAM.jpg	S4
657.5	SAM	Surface Aggregate Missing	3216	657.5-SAM.jpg	S4
783.3	SAM	Surface Aggregate Missing	3523	783.3-SAM.jpg	S4
821.1	SAM	Surface Aggregate Missing	3638	821.1-SAM.jpg	S4
821.1	SSS	Surface Spalling	3665	821.1-SSS.jpg	S2
953.8	SAM	Surface Aggregate Missing	3966	953.8-SAM.jpg	S4
973.6	CH2	Crack Longitudinal Hinge, 2	4053	973.6-CH2.jpg	-
1063.2	CH2	Crack Longitudinal Hinge, 2	4272	1063.2-CH2.jpg	-
1144.9	SAM	Surface Aggregate Missing	5959	1144.9-SAM.jpg	S4
1193	TBI	Tap Break-in Intruding	6111	1193-TBI.jpg	M3
1204.8	AMH	Manhole	6314	1204.8-AMH.jpg	-

PACP Code:	**AMH**
Description:	**Manhole**
Distance (ft):	**0**
Structural Grade:	**0**
O&M Grade:	**0**
Clock Start/From:	
Clock To:	
1st Value:	
2nd Value:	
Continuous Index:	
Within 8" of Joint?:	**False**
Remarks:	**21**



PACP Code:	**MWL**
Description:	**Water Level**
Distance (ft):	**0**
Structural Grade:	**0**
O&M Grade:	**0**
Clock Start/From:	
Clock To:	
1st Value:	
2nd Value:	
Continuous Index:	
Within 8" of Joint?:	**False**
Remarks:	

PACP Code:	**SAM**
Description:	**Surface Aggregate Missing**
Distance (ft):	**9**
Structural Grade:	**4**
O&M Grade:	**0**
Clock Start/From:	**10**
Clock To:	**11**
1st Value:	
2nd Value:	
Continuous Index:	
Within 8" of Joint?:	**False**
Remarks:	

PACP Code: **SAMC**
Description: **Surface Aggregate Missing Chemical**

Distance (ft): **30.4**
Structural Grade: **2**
O&M Grade: **0**
Clock Start/From: **11**
Clock To: **12**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **99.5**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **8**
Clock To: **4**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **116.2**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **1**
Clock To: **4**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **224.8**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **9**
Clock To: **3**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **CH2**
Description: **Crack Longitudinal Hinge, 2**

Distance (ft): **293.8**
Structural Grade: **0**
O&M Grade: **0**
Clock Start/From: **9**
Clock To:
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **293.8**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **8**
Clock To: **4**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **325.2**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **11**
Clock To: **1**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **431.2**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **8**
Clock To: **3**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **657.5**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **8**
Clock To: **4**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **783.3**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **8**
Clock To: **12**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **821.1**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **8**
Clock To: **3**
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SSS**
Description: **Surface Spalling**

Distance (ft): **821.1**
Structural Grade: **2**
O&M Grade: **0**
Clock Start/From: **12**
Clock To:
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **SAM**
Description: **Surface Aggregate Missing**

Distance (ft): **953.8**
Structural Grade: **4**
O&M Grade: **0**
Clock Start/From: **8**
Clock To: **4**
1st Value:
2nd Value:
Continuous Index: **S01**
Within 8" of Joint?: **False**
Remarks:

PACP Code: **CH2**
Description: **Crack Longitudinal Hinge, 2**

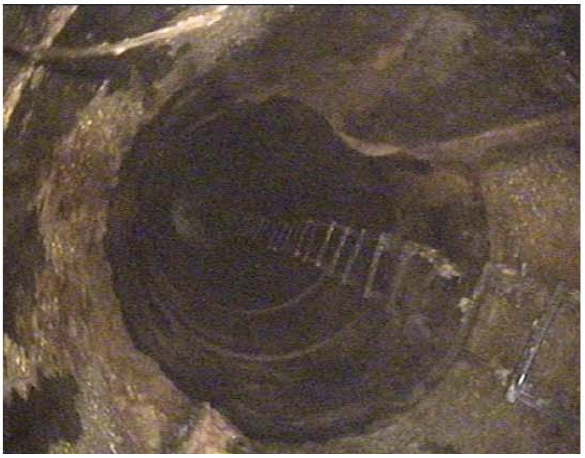
Distance (ft): **973.6**
Structural Grade: **0**
O&M Grade: **0**
Clock Start/From: **1**
Clock To:
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code: **CH2**
Description: **Crack Longitudinal Hinge, 2**

Distance (ft): **1063.2**
Structural Grade: **0**
O&M Grade: **0**
Clock Start/From: **4**
Clock To:
1st Value:
2nd Value:
Continuous Index:
Within 8" of Joint?: **False**
Remarks:

PACP Code:	**SAM**
Description:	**Surface Aggregate Missing**
Distance (ft):	**1144.9**
Structural Grade:	**4**
O&M Grade:	**0**
Clock Start/From:	**8**
Clock To:	**4**
1st Value:	
2nd Value:	
Continuous Index:	**F01**
Within 8" of Joint?:	**False**
Remarks:	

PACP Code:	**TBI**
Description:	**Tap Break-in Intruding**
Distance (ft):	**1193**
Structural Grade:	**0**
O&M Grade:	**3**
Clock Start/From:	**1**
Clock To:	
1st Value:	**10**
2nd Value:	**10**
Continuous Index:	
Within 8" of Joint?:	**False**
Remarks:	

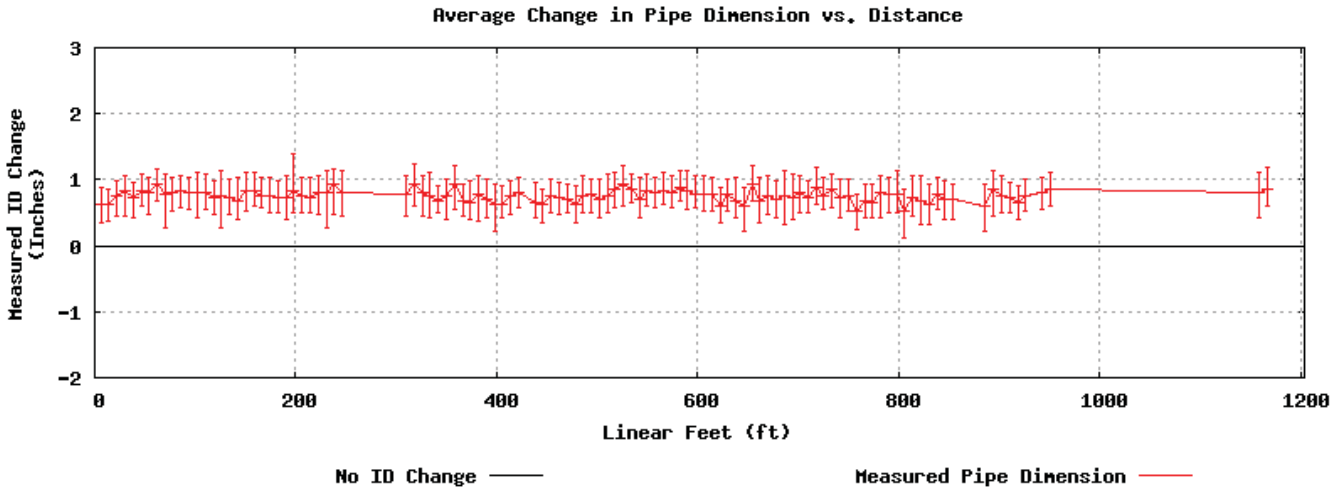


PACP Code:	**AMH**
Description:	**Manhole**
Distance (ft):	**1204.8**
Structural Grade:	**0**
O&M Grade:	**0**
Clock Start/From:	
Clock To:	
1st Value:	
2nd Value:	
Continuous Index:	
Within 8" of Joint?:	**False**
Remarks:	**19**

3 Ovality and Deflection

3.1 Average ID Graph

The inspected distance displayed below is the distance downstream from the 21 manhole.

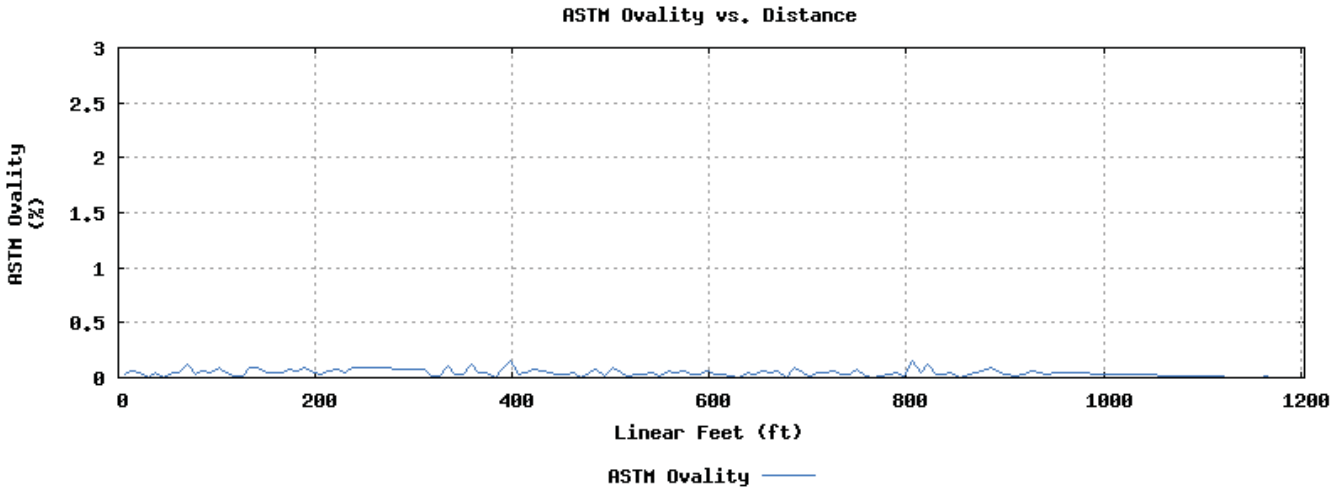


3.2 ASTM Ovality Graph (Half-Pipe)

The ASTM F1216 Ovality formula uses minimum and maximum diameters. We assume that the minimum and maximum diameters are orthogonal.

$$\text{Ovality} = (100\%)(Rh-Rv)/(Rh+Rv)$$

The inspected distance displayed below is the distance downstream from the 21 manhole.

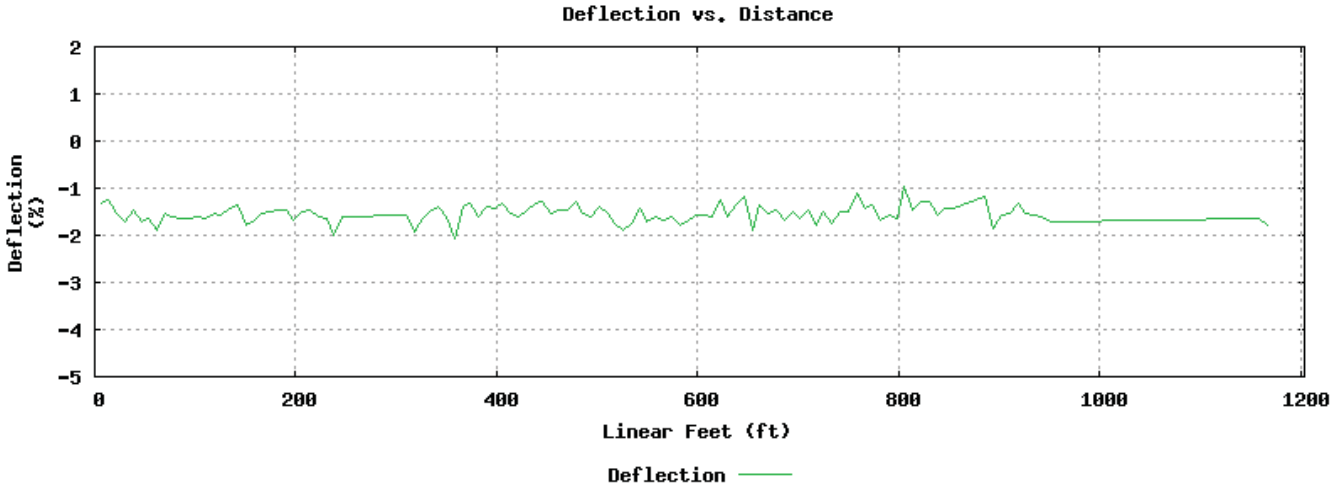


3.3 Deflection Graph (Half-Pipe)

Deflection is based on the vertical radius (half of the vertical diameter) and the RCD. For non-round pipe models, we use the record drawing model's vertical radius as the "RCD".

$$\text{Deflection} = (100\%)\ (1 - 2Rv/RCD)$$

The inspected distance displayed below is the distance downstream from the 21 manhole.

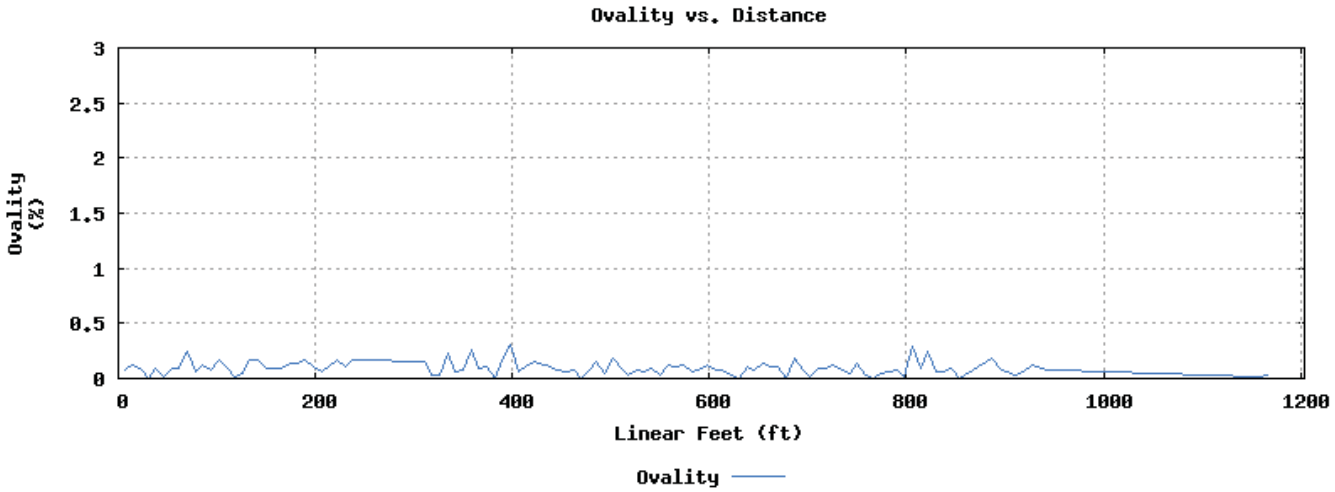


3.4 Ovality Graph (Half-Pipe)

Ovality is based on the ratio of the minimum diameter (assumed to be vertical) to the maximum diameter (assumed to be horizontal). When only the top half of the pipe is visible, we double the vertical radius to get vertical diameter.

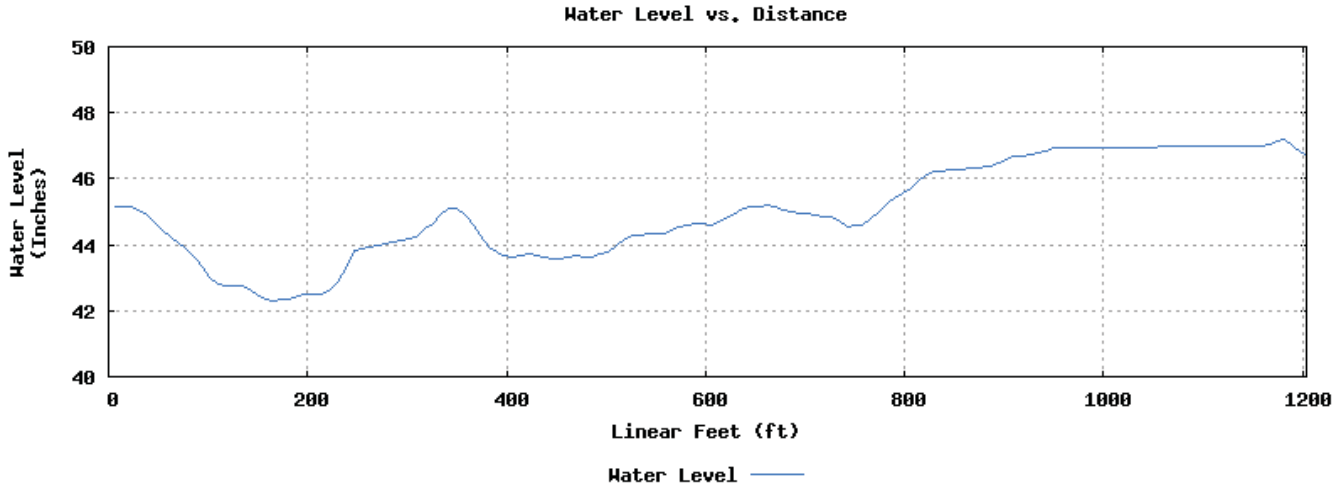
$$\text{Ovality} = (100\%)(1-Rv/Rh)$$

The inspected distance displayed below is the distance downstream from the 21 manhole.



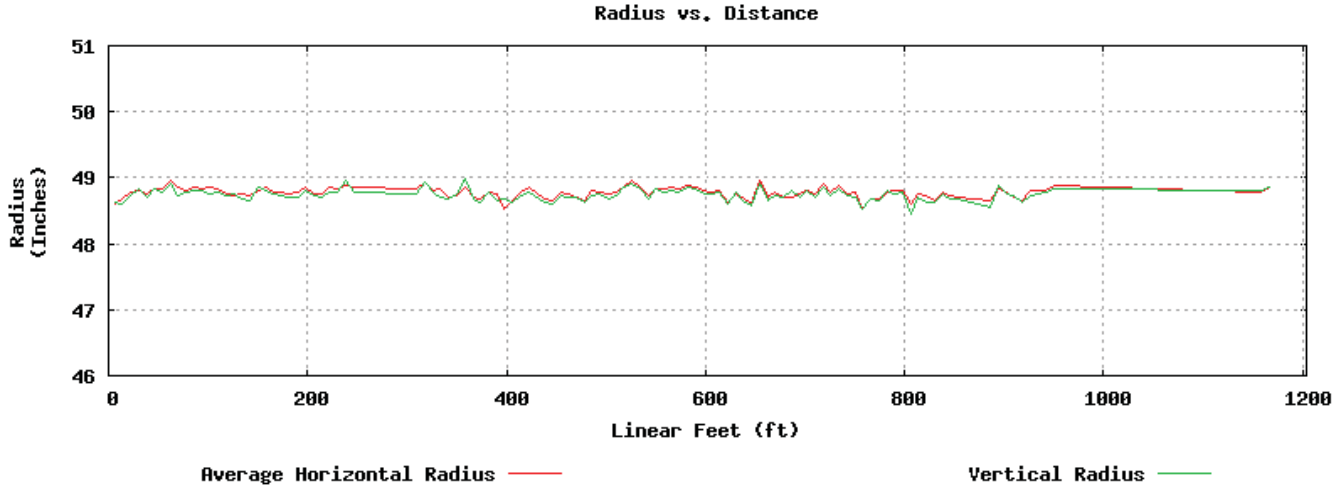
3.5 Water Level

The inspected distance displayed below is the distance downstream from the 21 manhole.



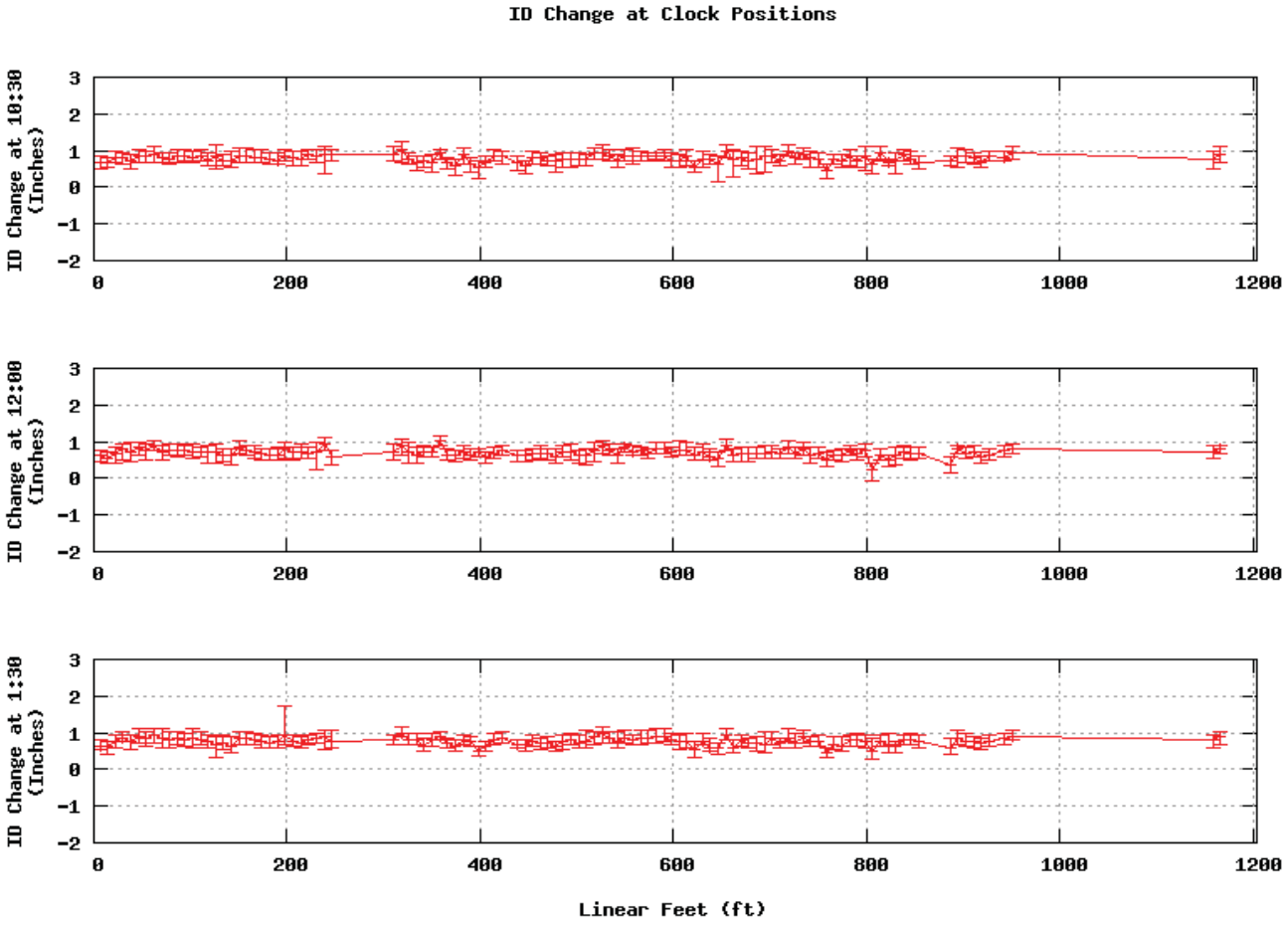
3.6 Vertical and Horizontal Radius

The inspected distance displayed below is the distance downstream from the 21 manhole.



3.7 ID at Clock Positions

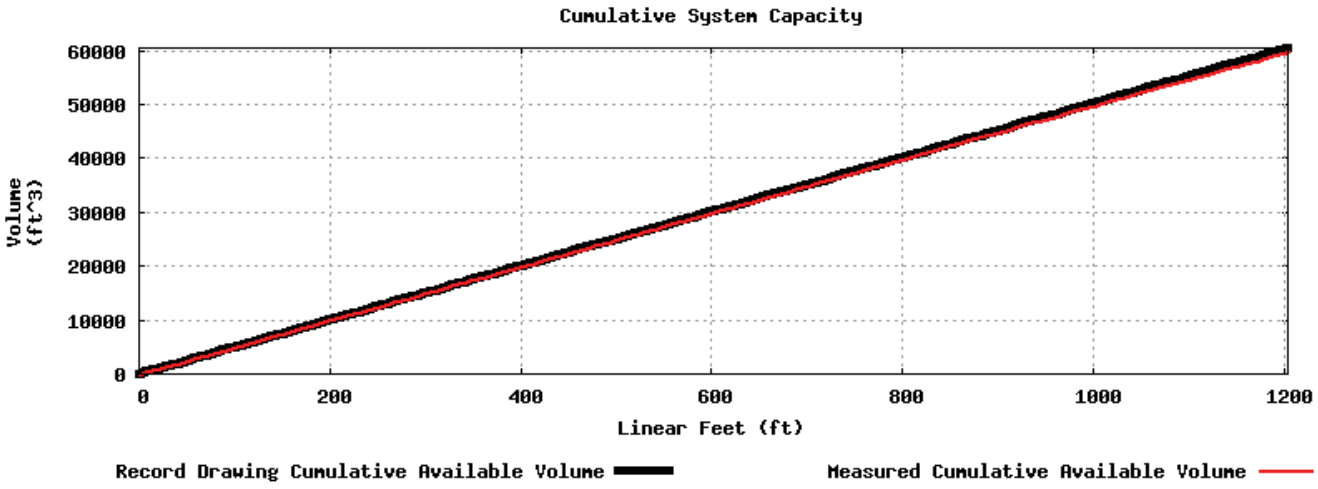
The inspected distance displayed below is the distance downstream from the 21 manhole.



4 Sediment

4.1 Cumulative System Capacity

The inspected distance displayed below is the distance downstream from the 21 manhole.

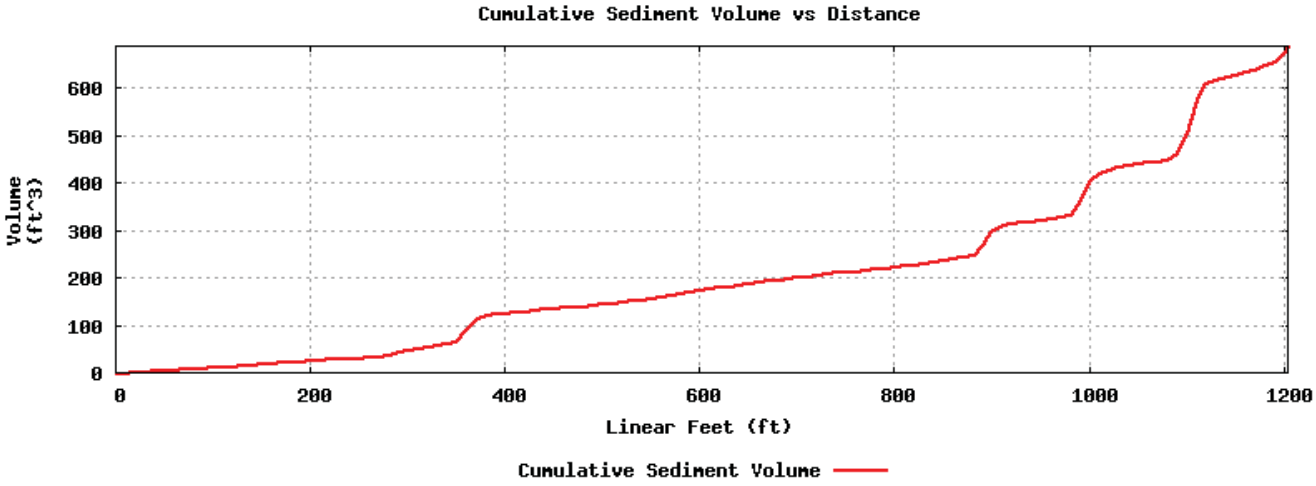


Inspection Distance	1204 ft
Record Drawing Available Capacity	60519.6 ft ^{3}
Measured Available Capacity	59831.2 ft ^{3}
% Available Capacity	98.9 %

4.2 Cumulative Sediment Volume

The actual free space capacity is derived from the cross sectional sonar scans. In order to determine sediment volume, the actual free space capacity is subtracted from the total as-built capacity.

The inspected distance displayed below is the distance downstream from the 21 manhole.

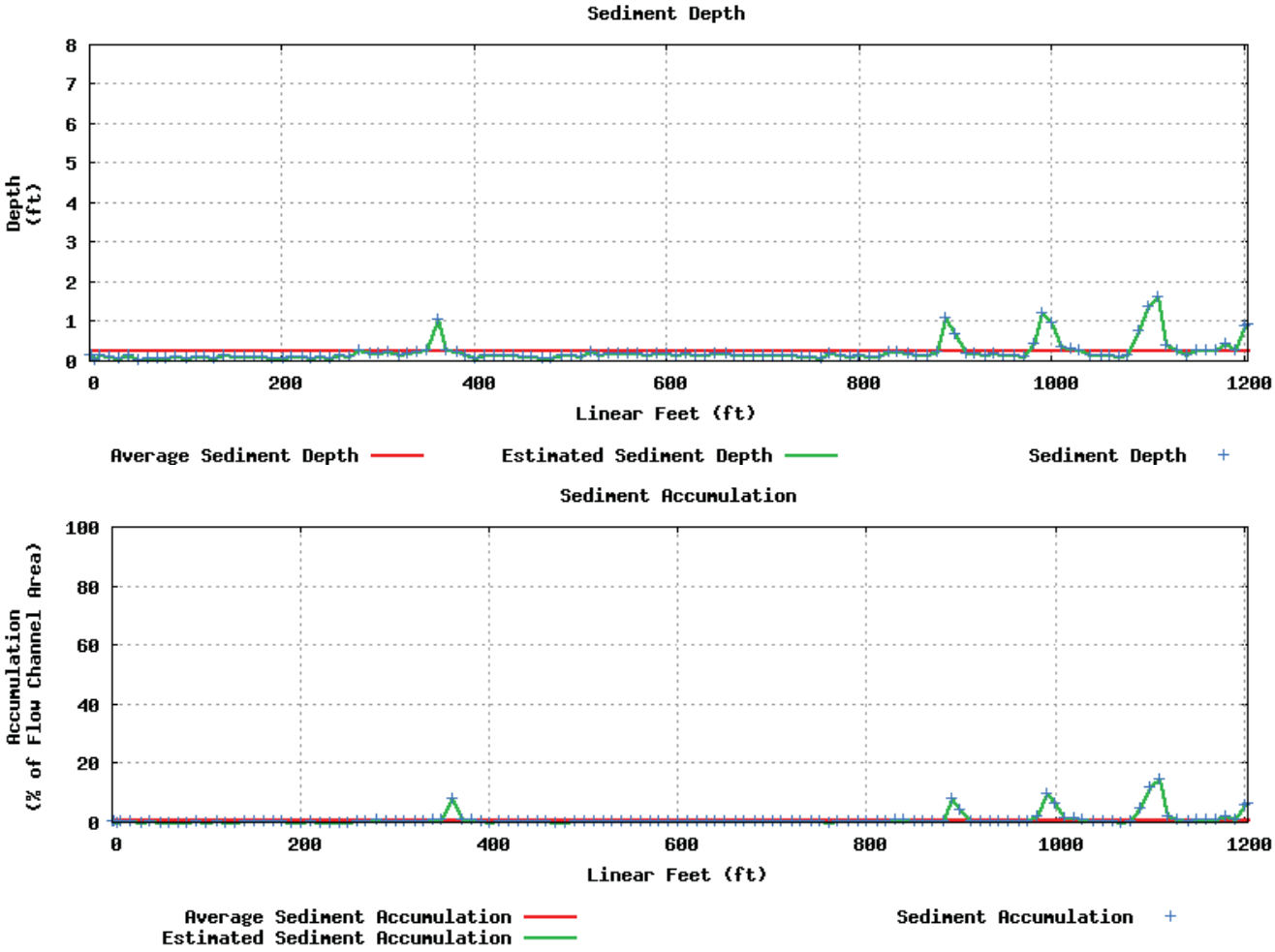


Inspection Distance	1204 ft
Cumulative Sediment Volume	688.4 ft ^{3}

4.3 Average Sediment Depth

The standard sediment depth measurement graph represents a comprehensive summary of pipe sediment depth over distance.

The inspected distance displayed below is the distance downstream from the 21 manhole.



Measure	Location	Depth	Accumulation
Maximum	1110.5 ft	19.4 in	14.5 %
Minimum	50.5 ft	0.6 in	0.1 %
Average	N/A	3.4 in	1.1 %

4.4 Cleaning Recommendations

The table below depicts the level of cleaning recommended throughout the inspected length. The recommendations are based on sediment volume, not type of material.

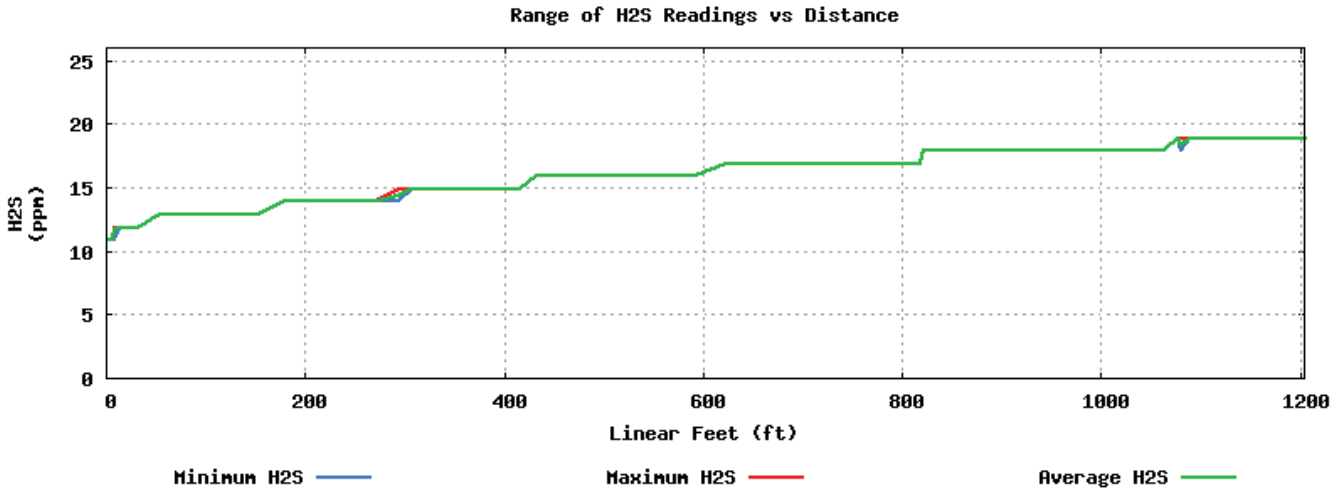
Recommendation	% of Capacity Lost	Distance Inspected	% of Total Length
No Cleaning	0% to 5%	1143.3 ft	95 %
Light Cleaning	6% to 15%	60.7 ft	5 %
Moderate Cleaning	16% to 30%	0 ft	0 %
Heavy Cleaning	> 30%	0 ft	0 %

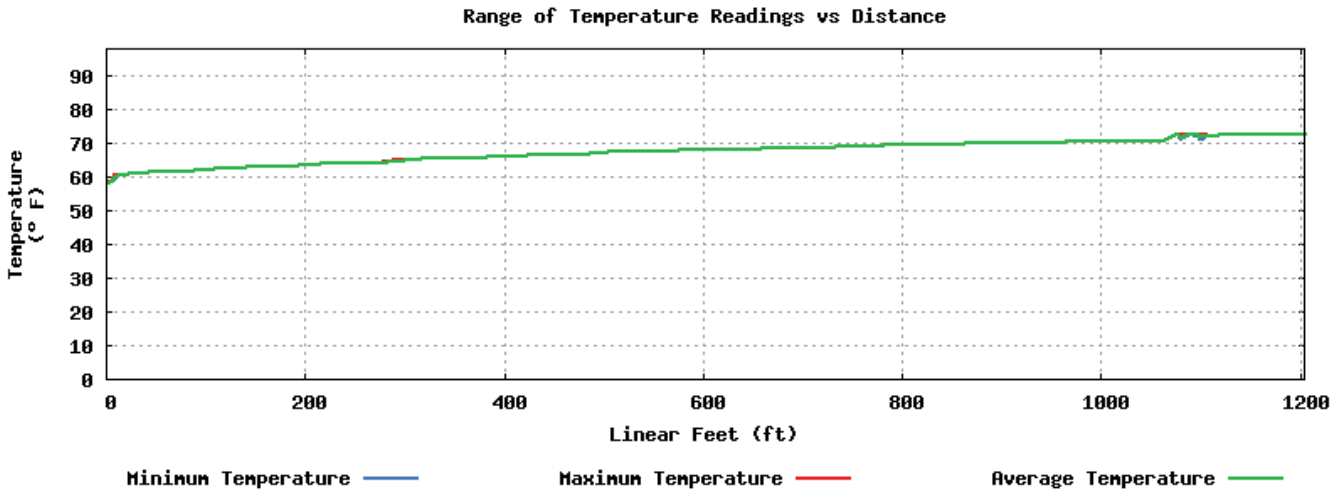
4.5 Cleaning Recommendations by Location

Start Location	End Location	Recommendations
0.0 ft	890.0 ft	No Cleaning
890.0 ft	898.9 ft	Light Cleaning
898.9 ft	980.5 ft	No Cleaning
980.5 ft	999.8 ft	Light Cleaning
999.8 ft	1090.0 ft	No Cleaning
1090.0 ft	1119.0 ft	Light Cleaning
1119.0 ft	1200.5 ft	No Cleaning
1200.5 ft	1204.0 ft	Light Cleaning

5 Gas

The inspected distance displayed below is the distance downstream from the 21 manhole.





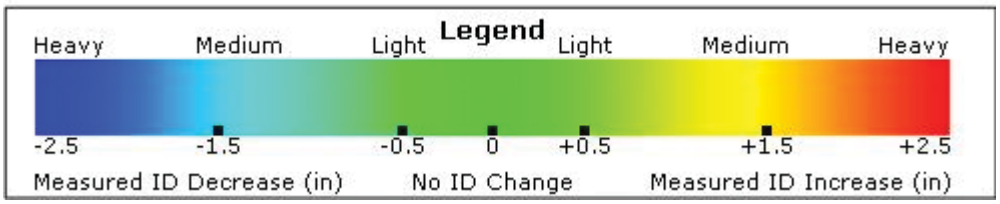
General Results	H2S Concentration	Temperature
Maximum	19 ppm	73 degrees F
Minimum	11 ppm	59 degrees F
Average	16.3 ppm	68 degrees F

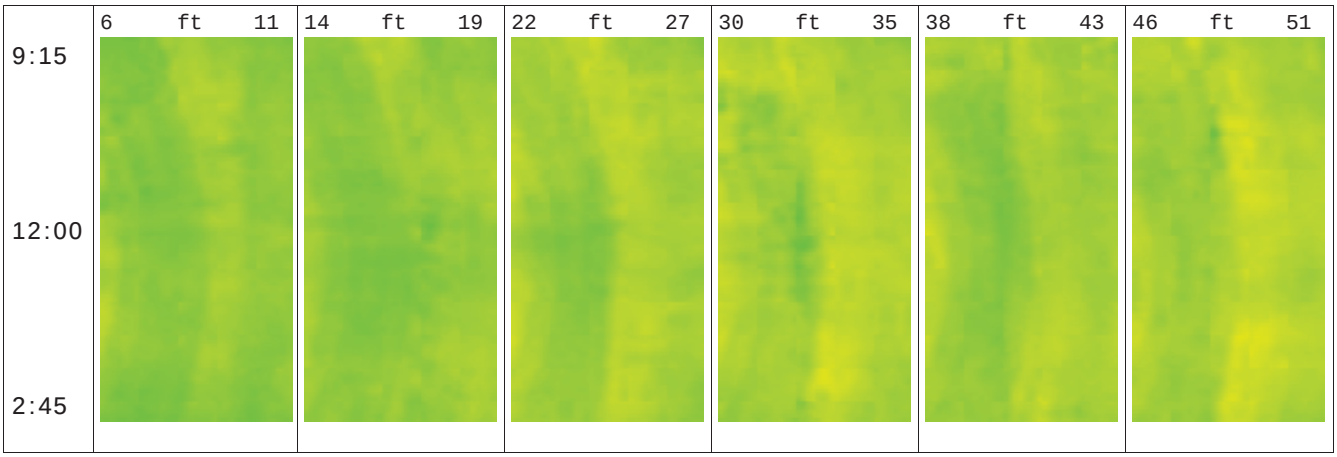
H2S Concentration	Cumulative Inspected Distance	% of Inspected Distance
Maximum > 2.0 ppm	1204.0 ft	100.0 %
Average > 2.0 ppm	1204.0 ft	100.0 %

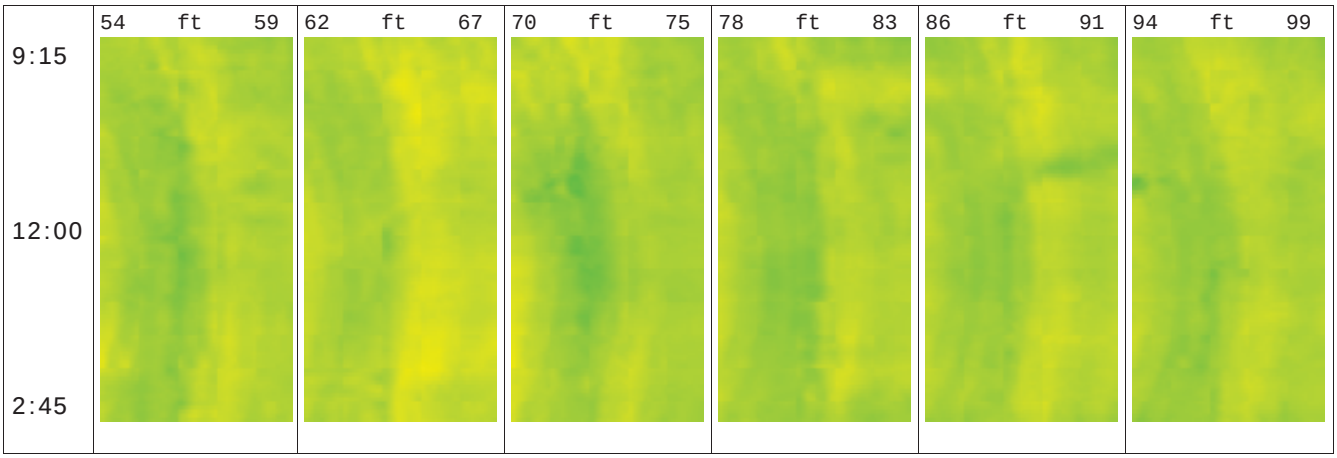
6 Corrosion and Buildup

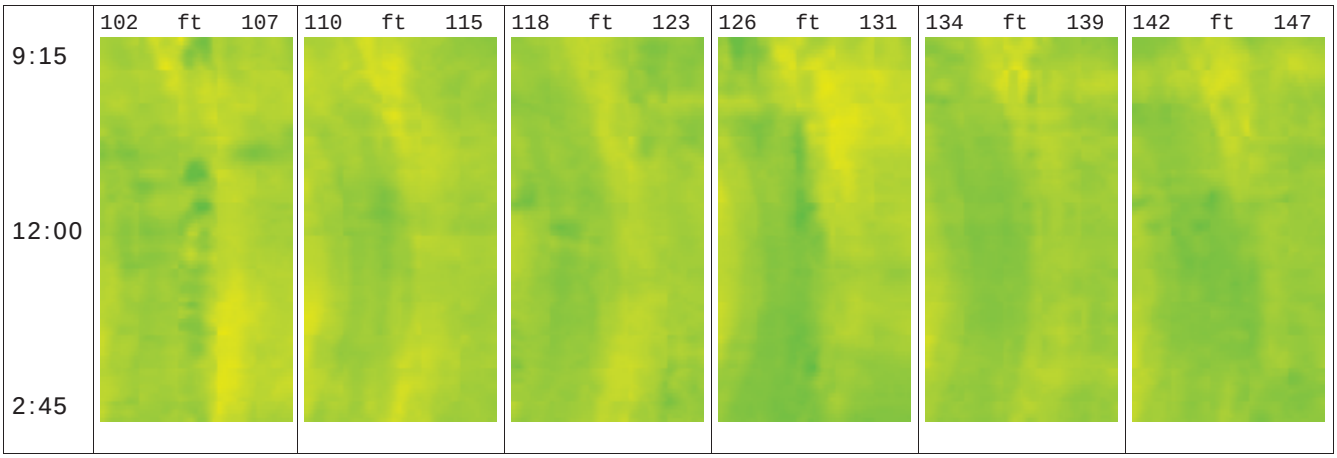
Laser scans marked with a ✳ symbol have been identified as a pipe feature such as a tap, lateral, connection, or access shaft. In order to accurately represent the pipe's condition, the data contained in scans of pipe features is excluded from the measurements and graphs of ovality, pipe geometry, and pipe wall loss.

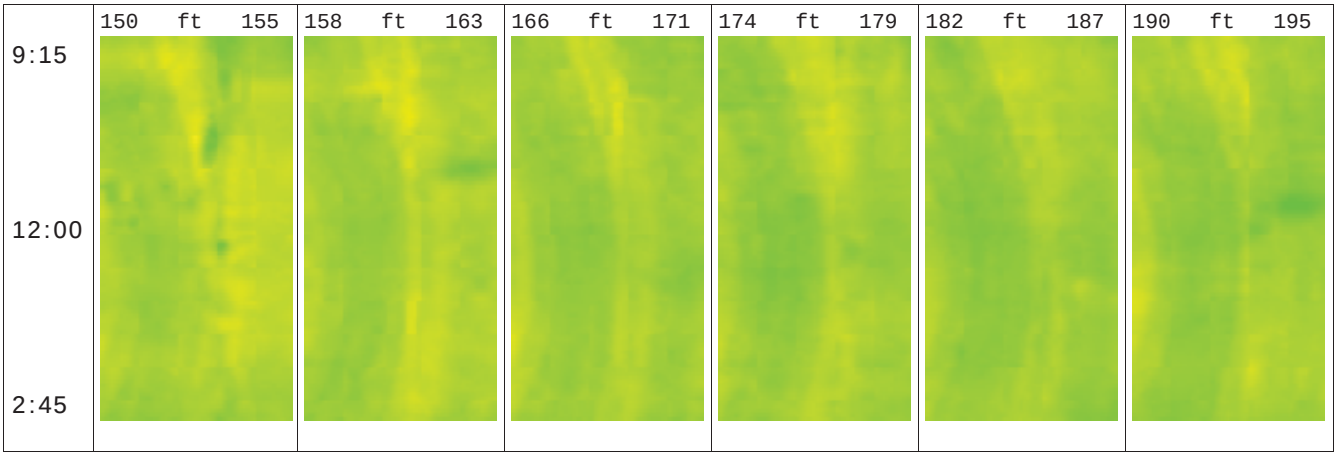
6.1 Precision Scans

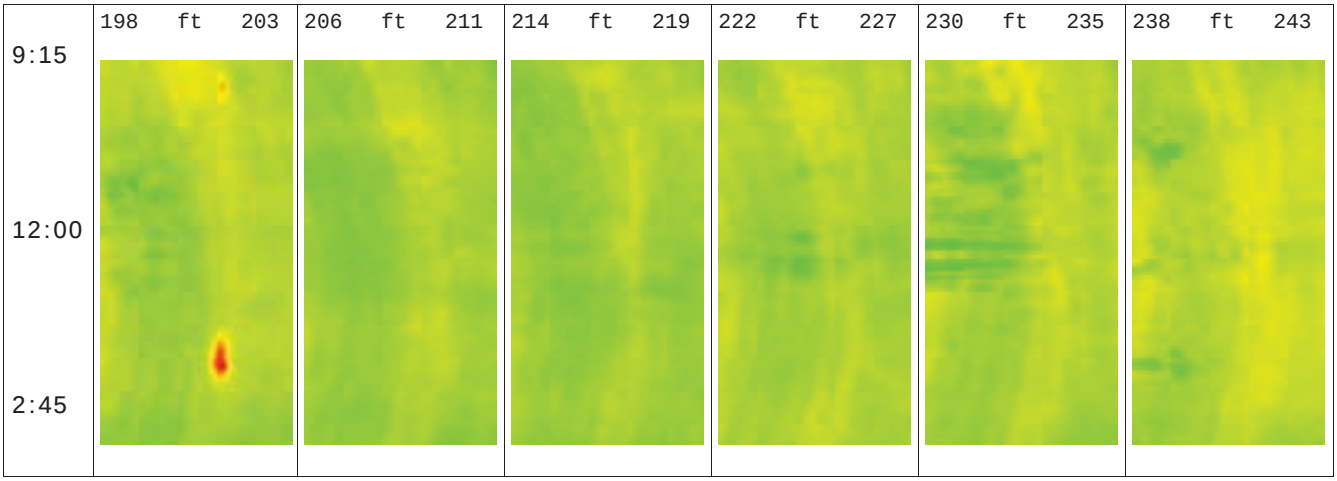


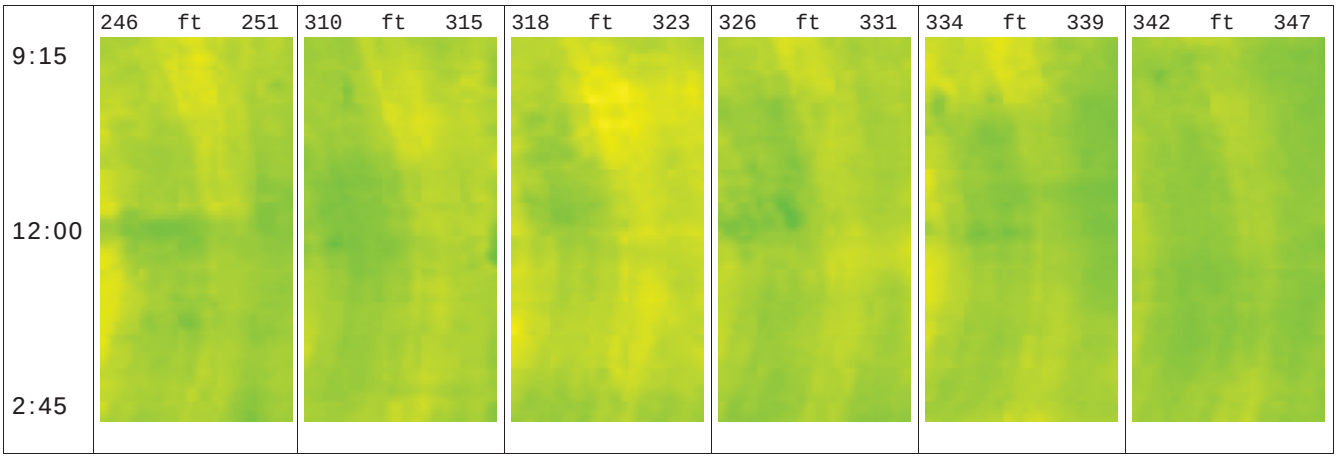


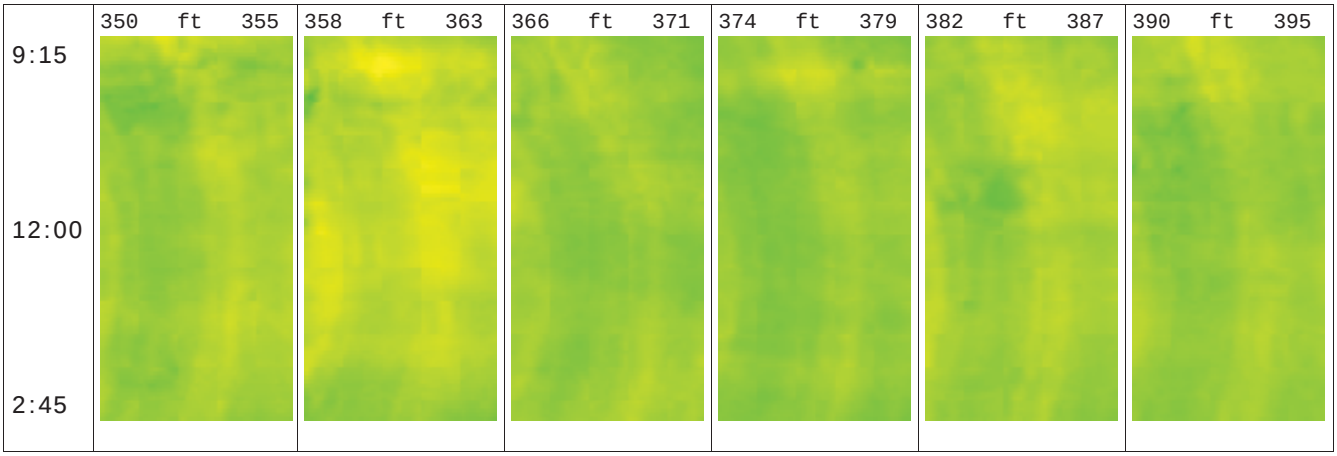


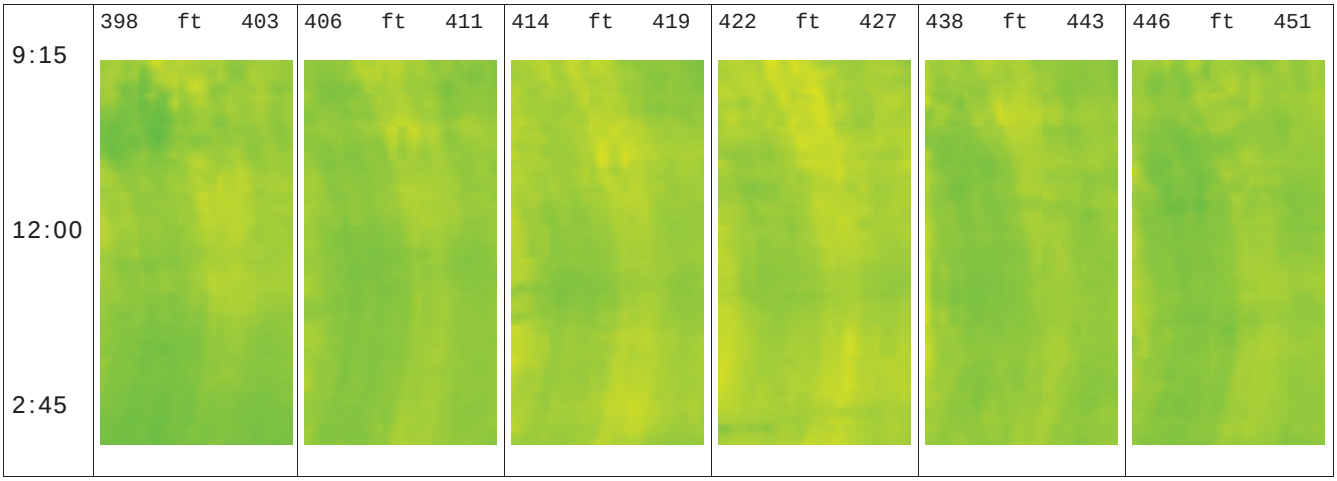


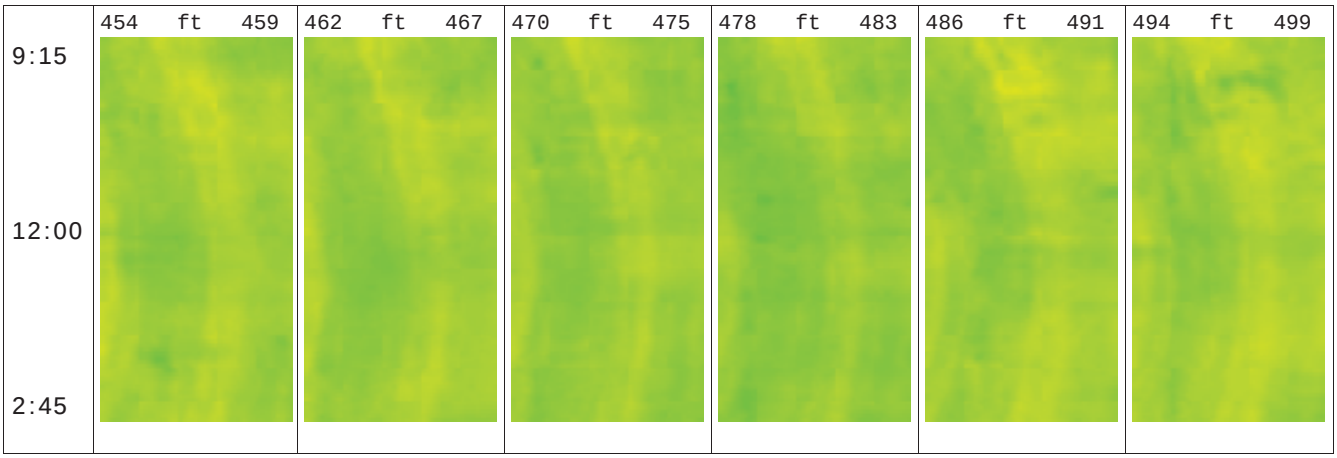


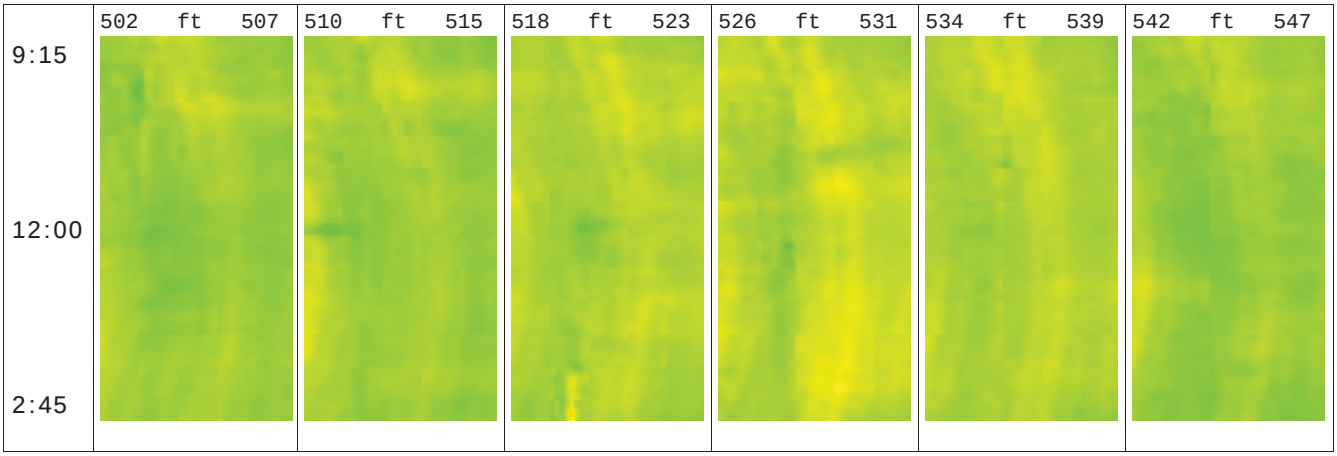


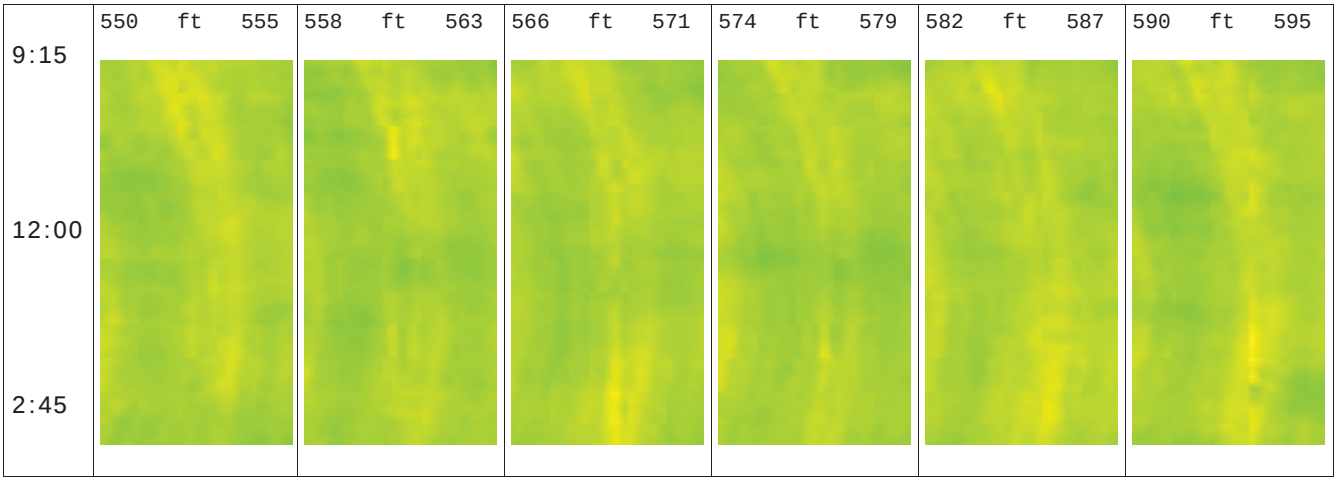


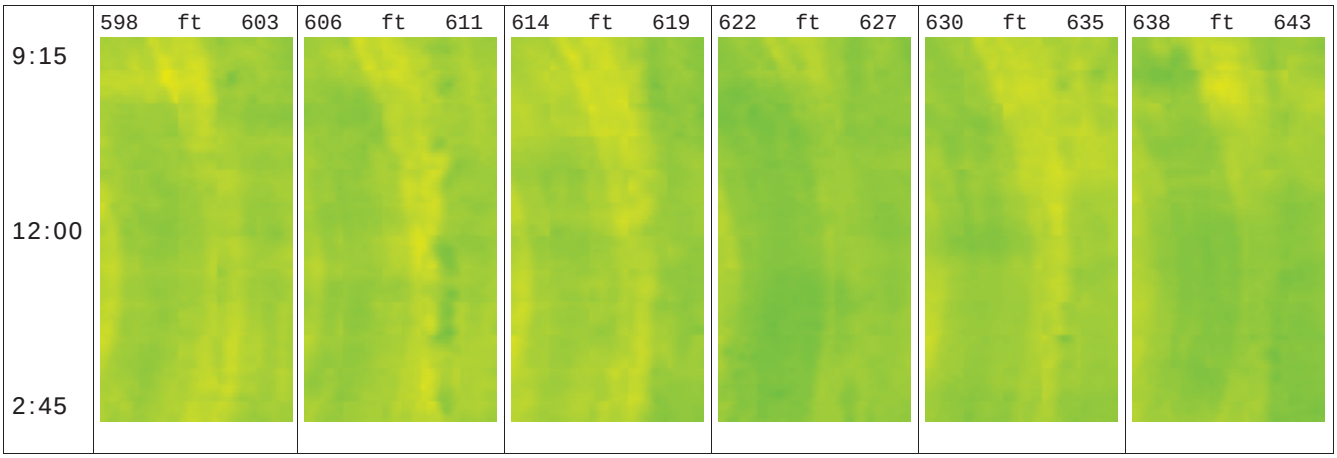


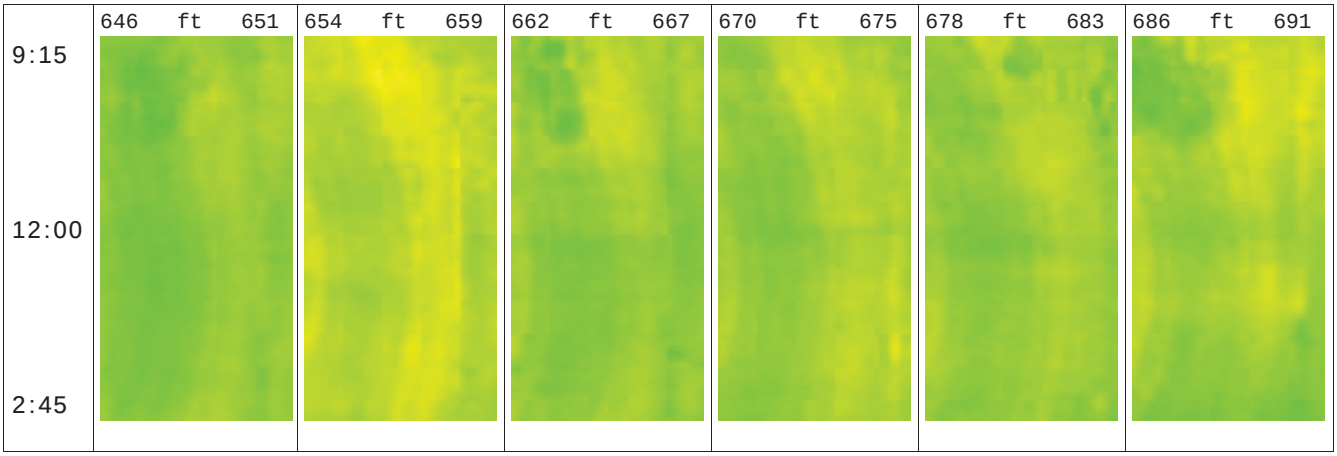


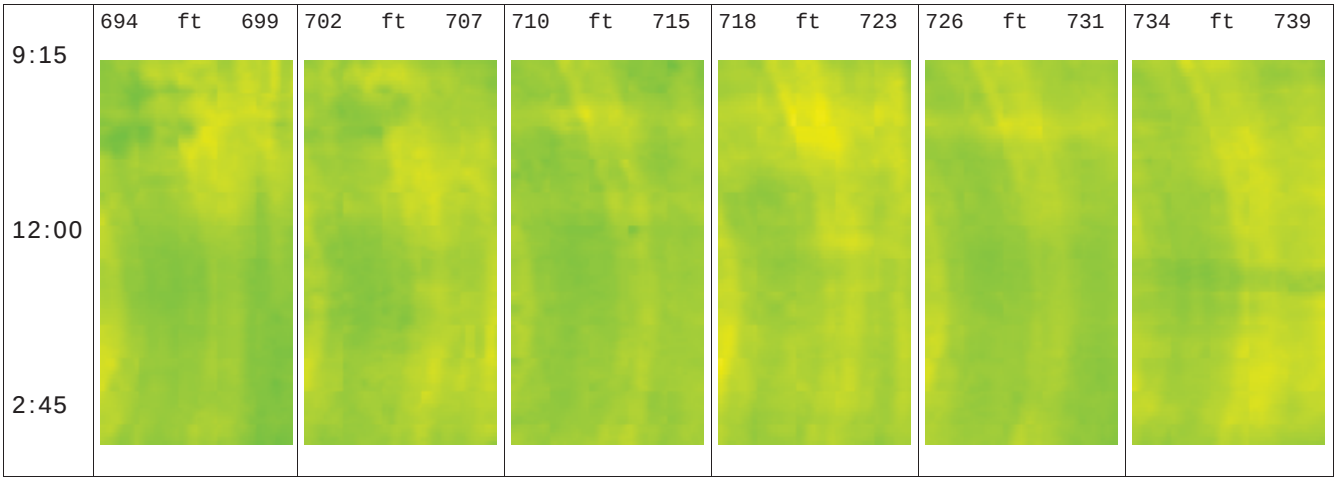


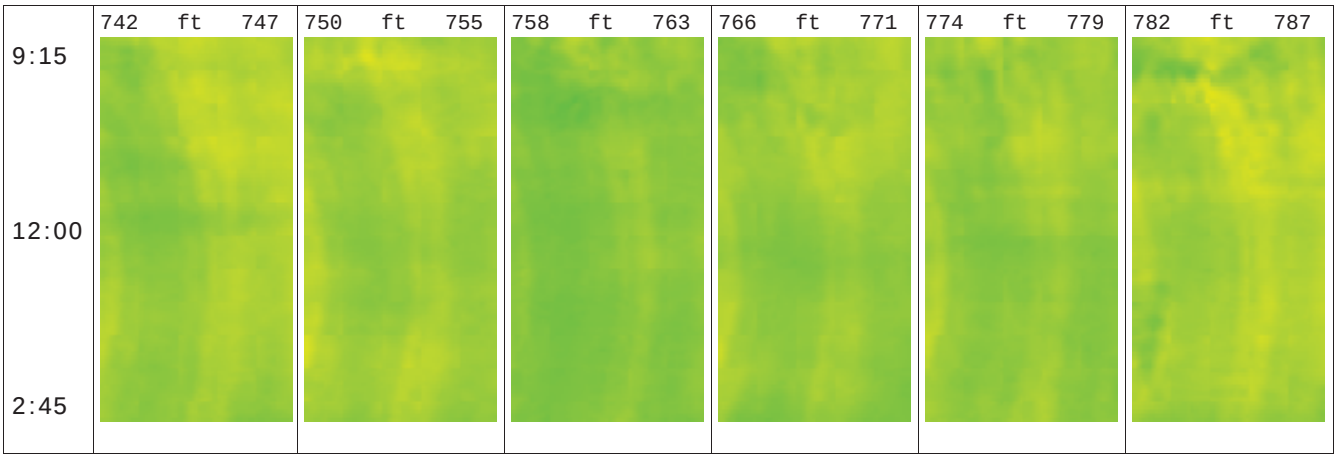


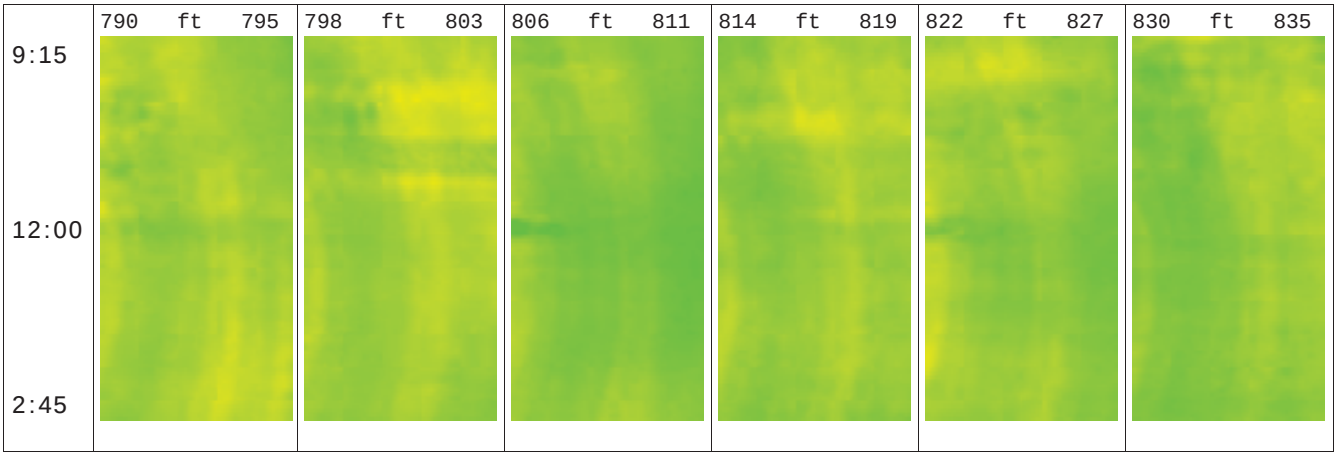


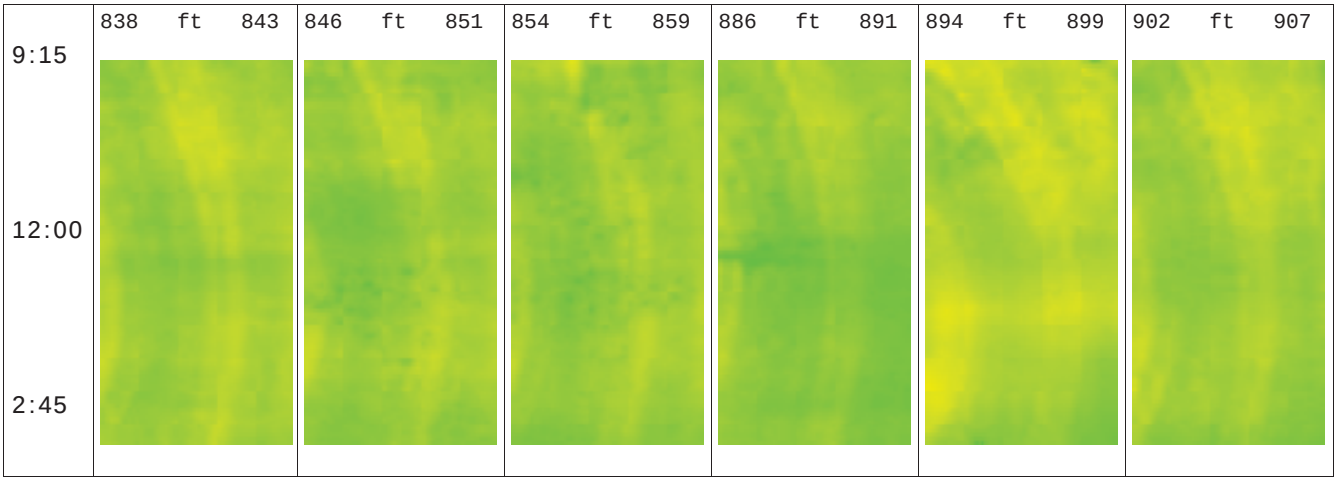


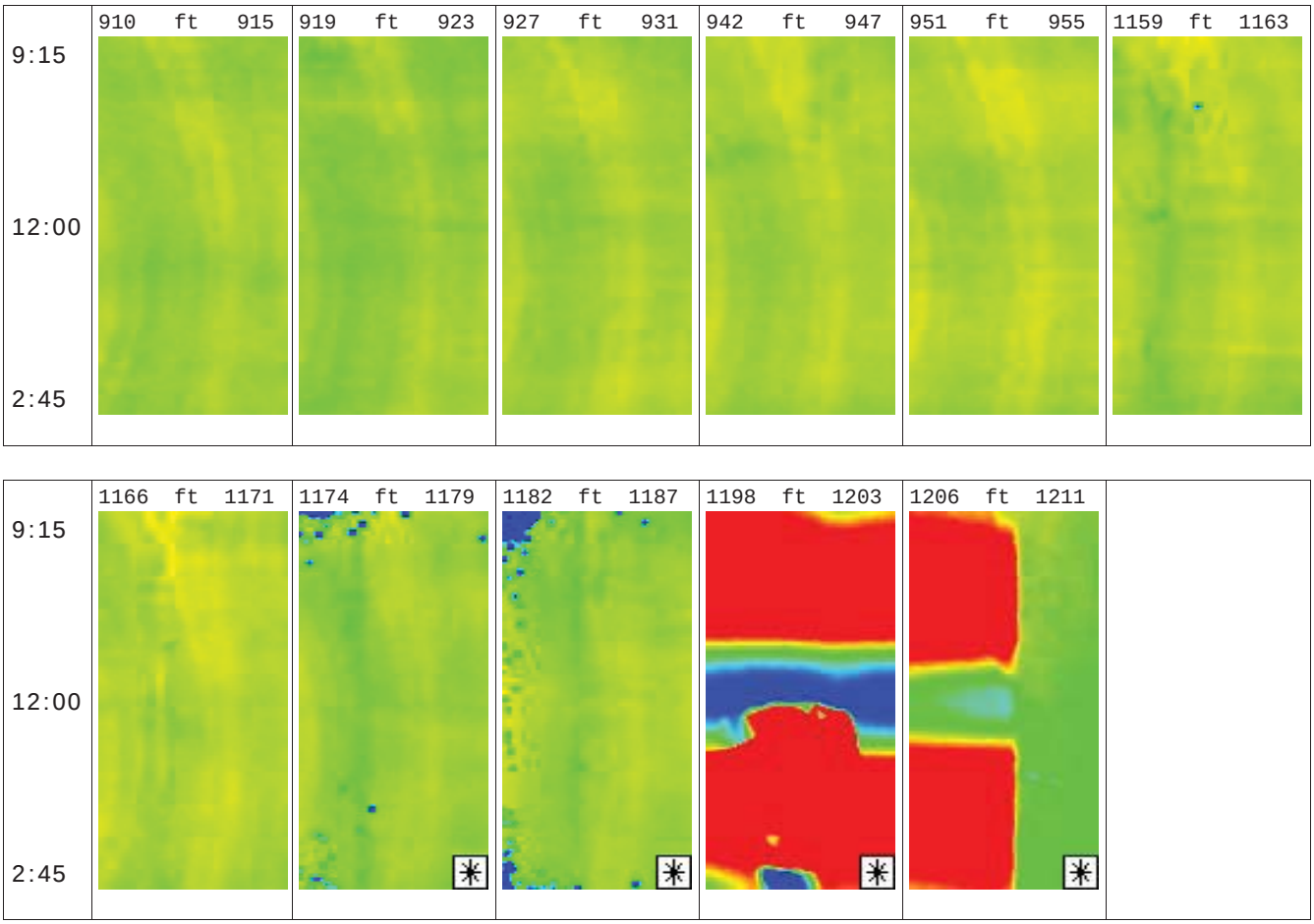




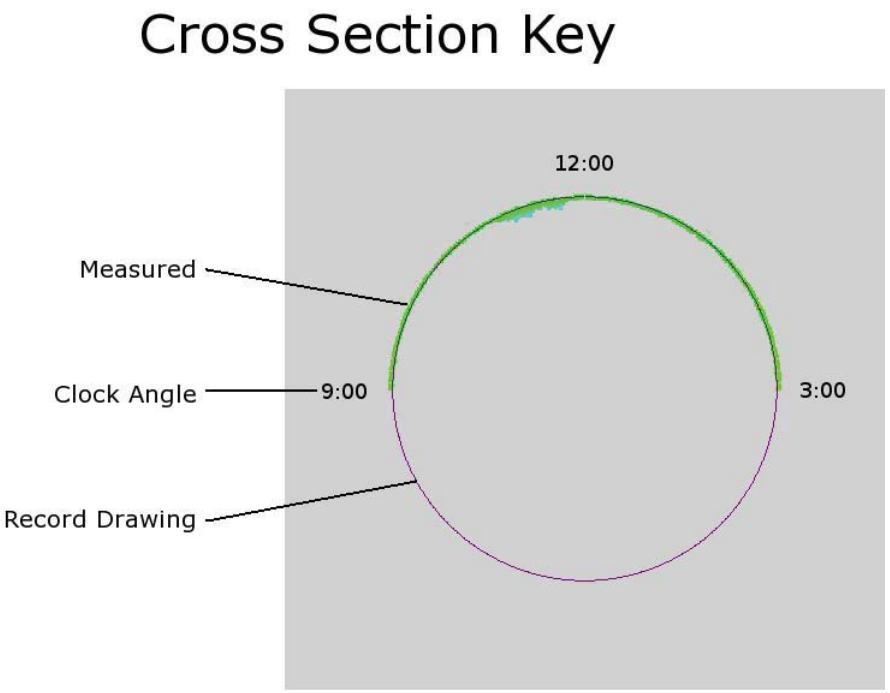


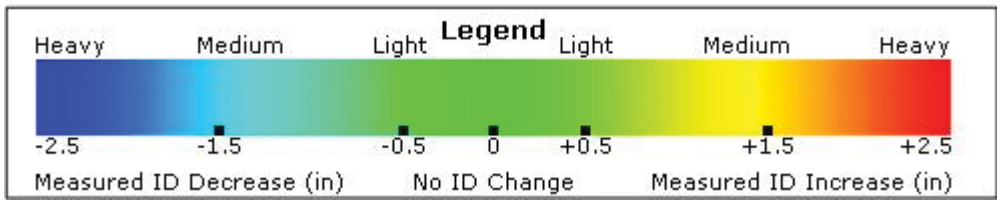


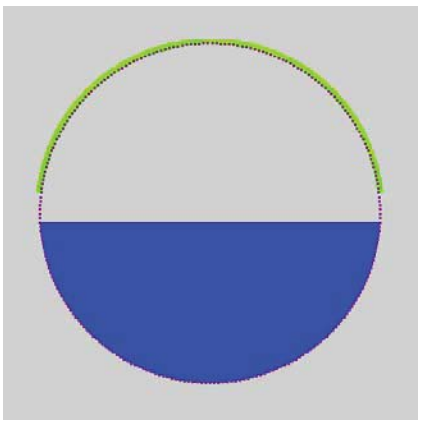
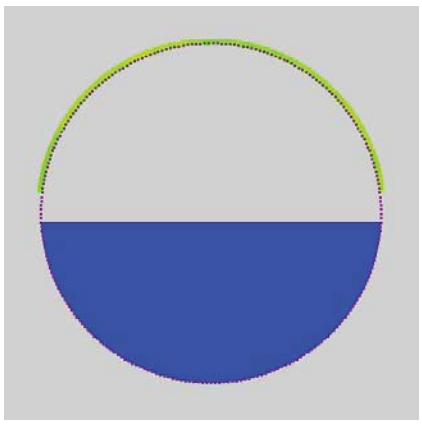
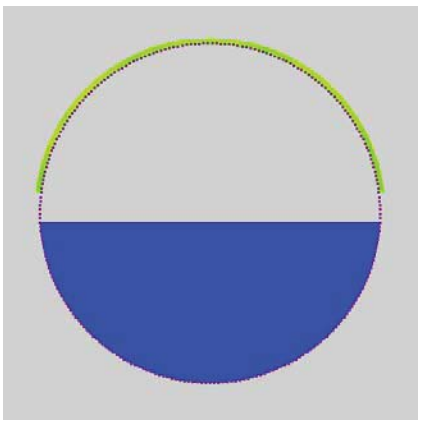




6.2 Cross Sections





6ft	14ft	22ft
		

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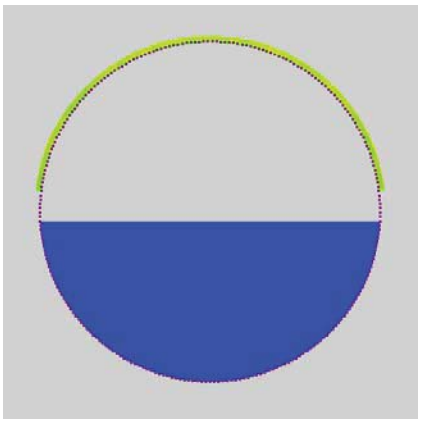

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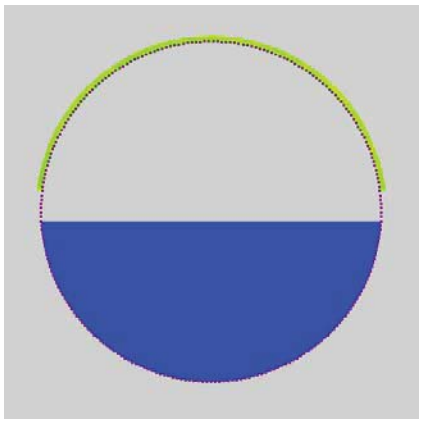

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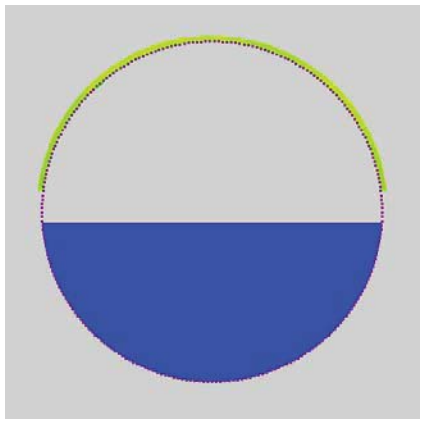

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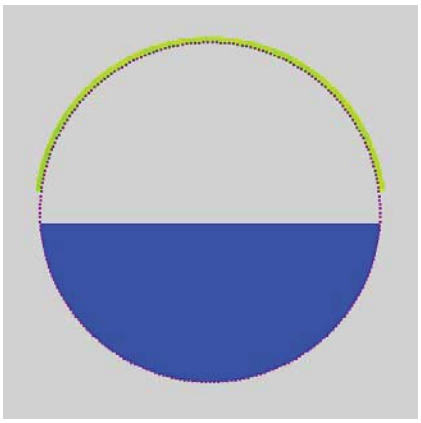

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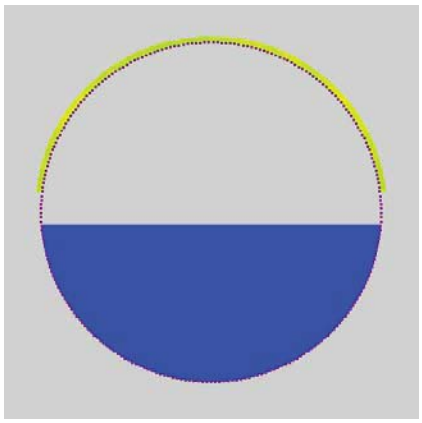

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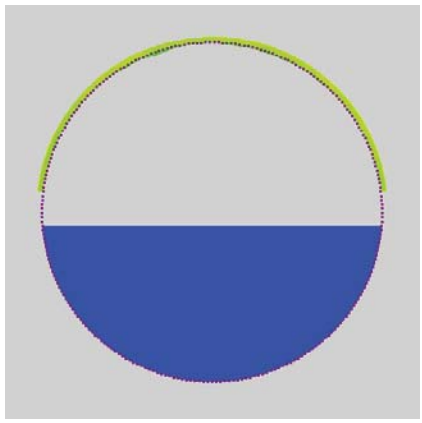

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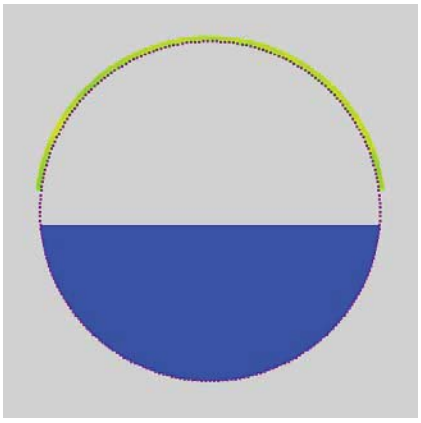

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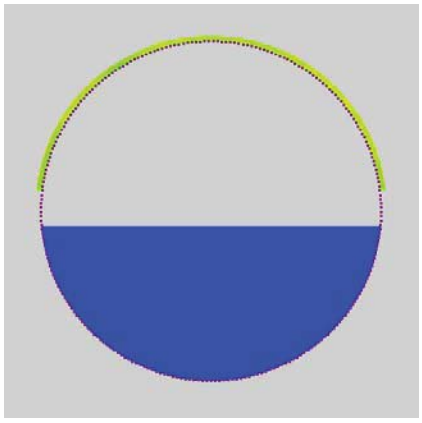

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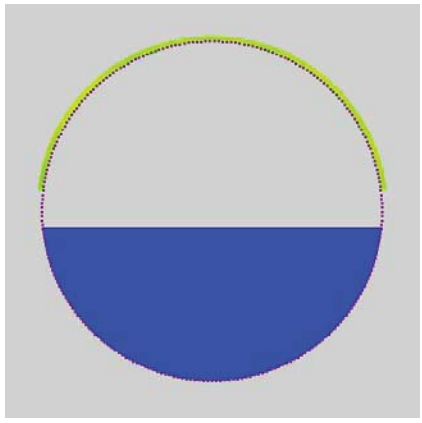

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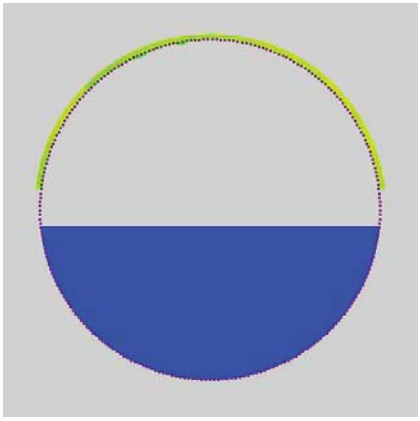

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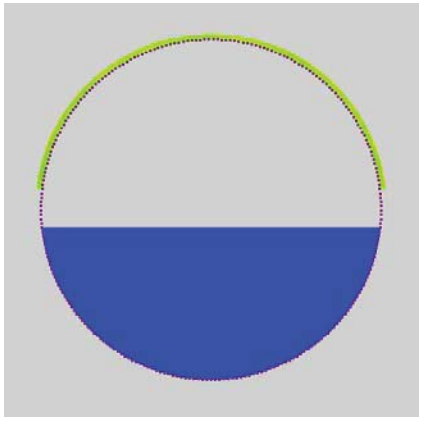

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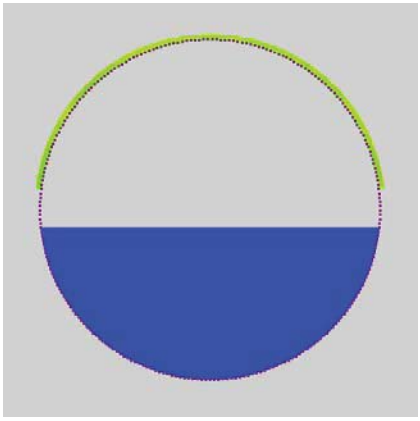

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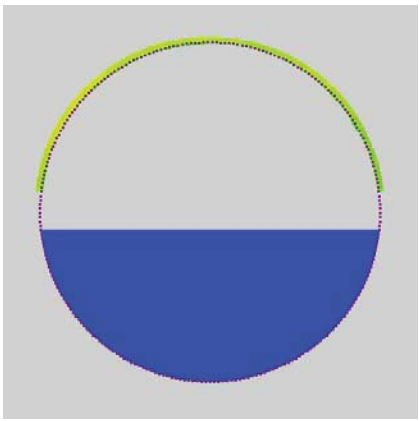

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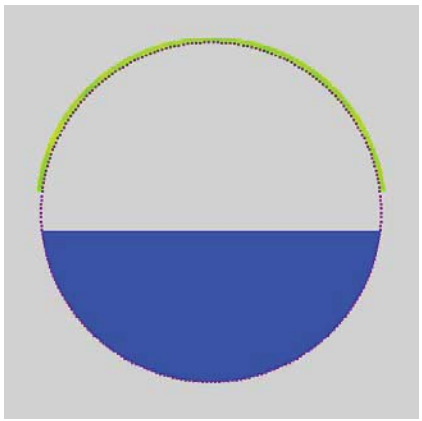

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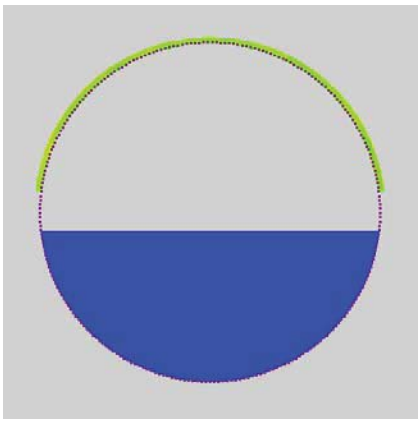

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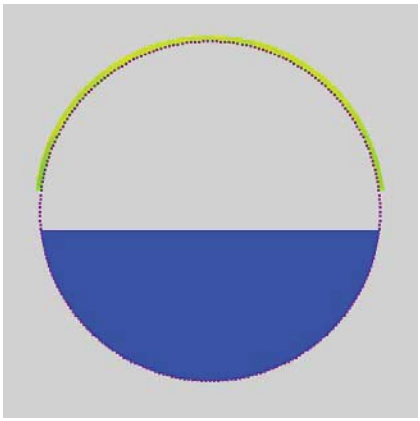

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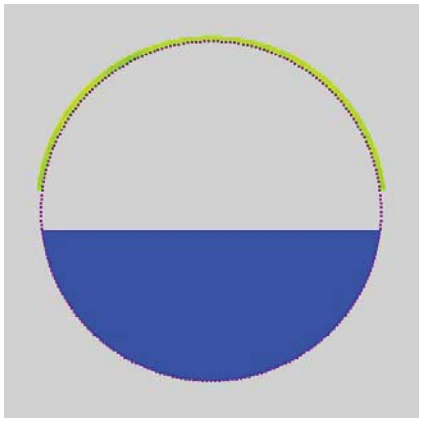

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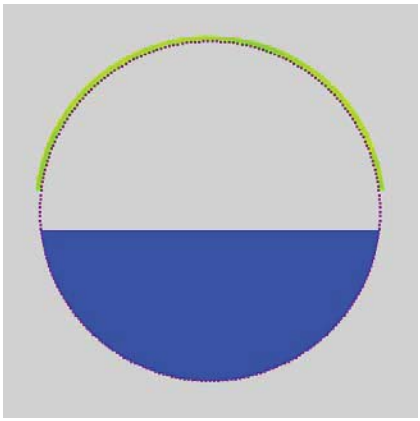

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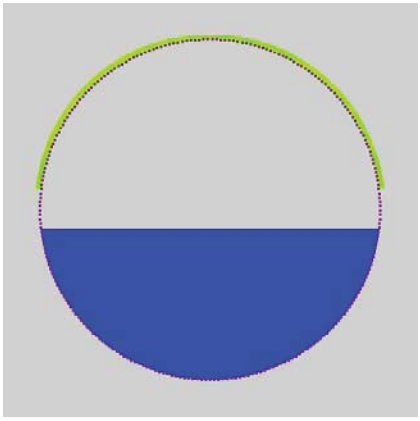

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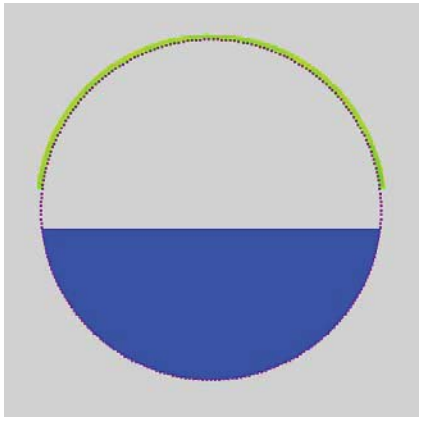

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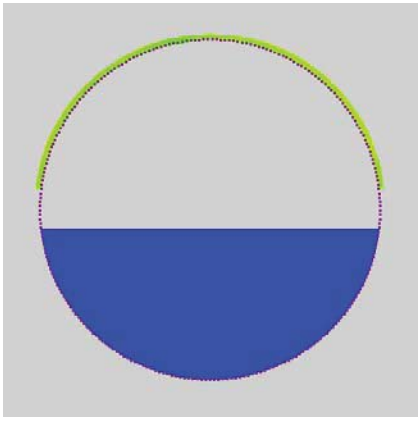

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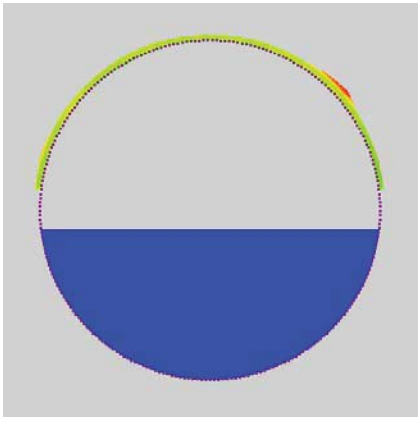

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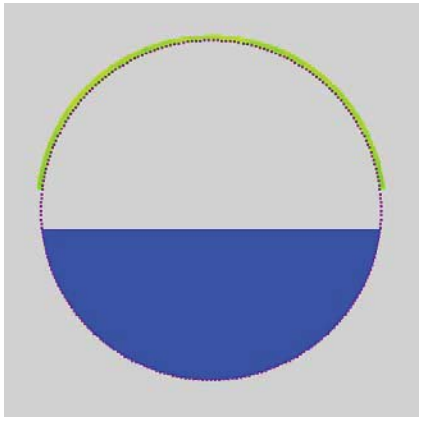

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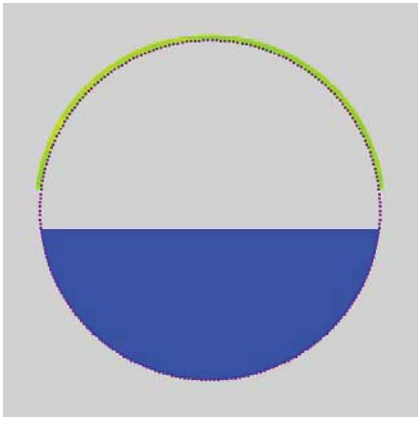

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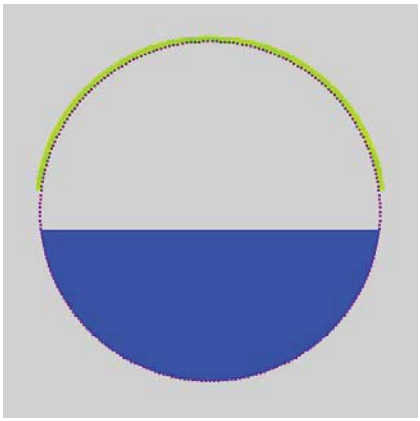

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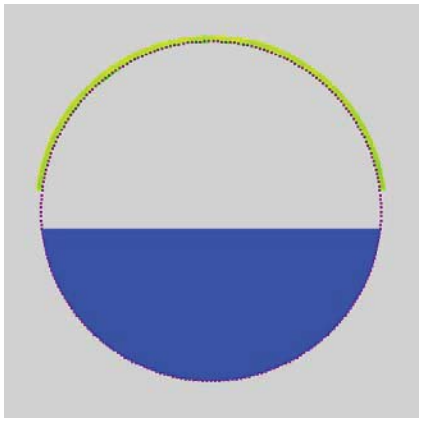

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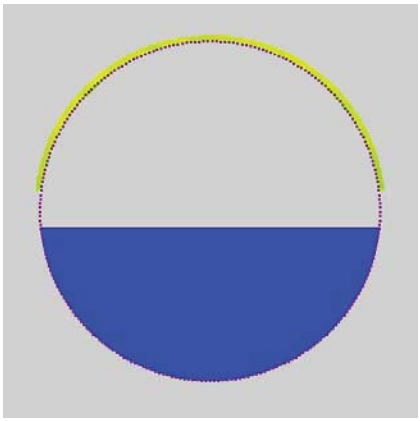

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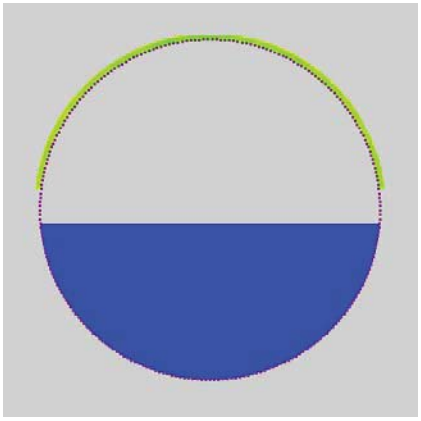

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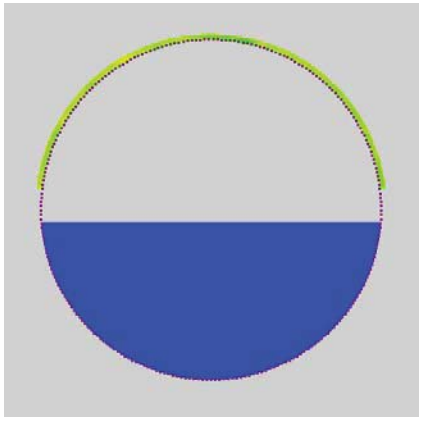

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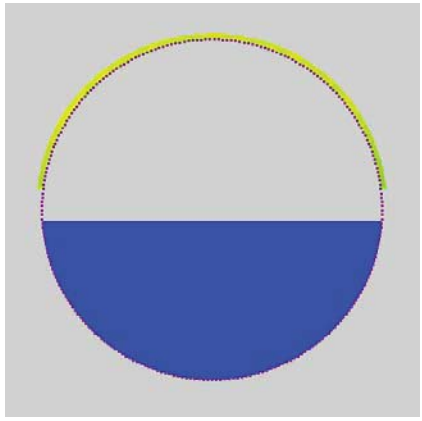

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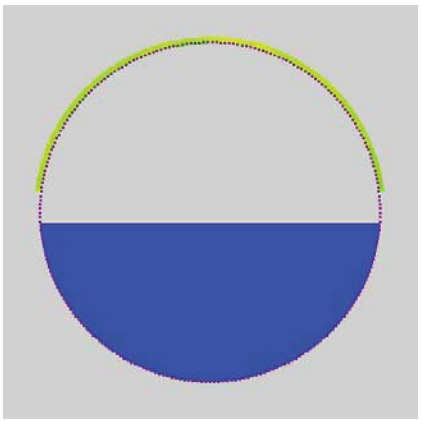

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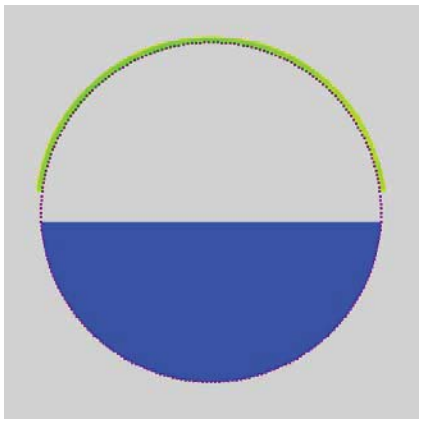

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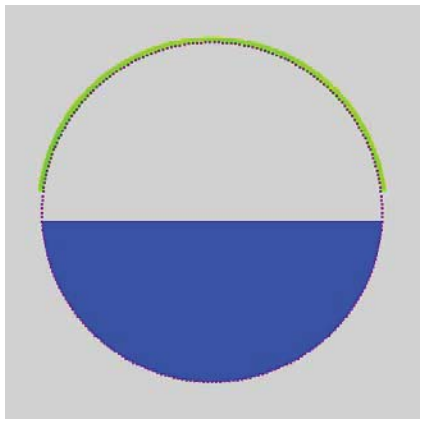

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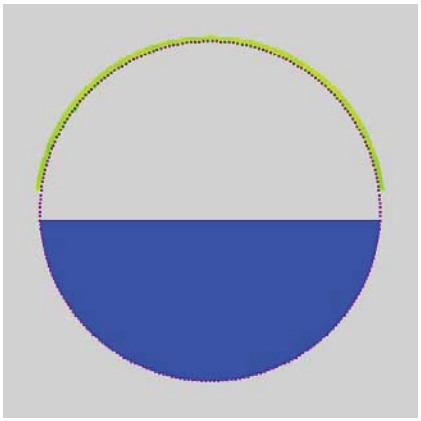

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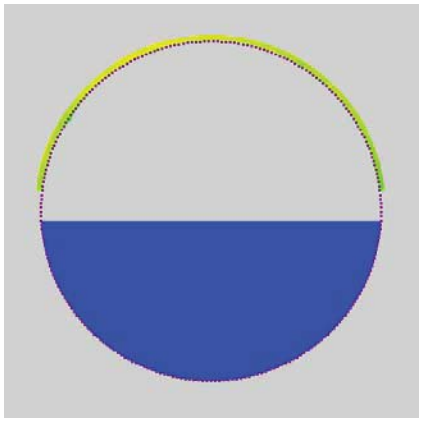

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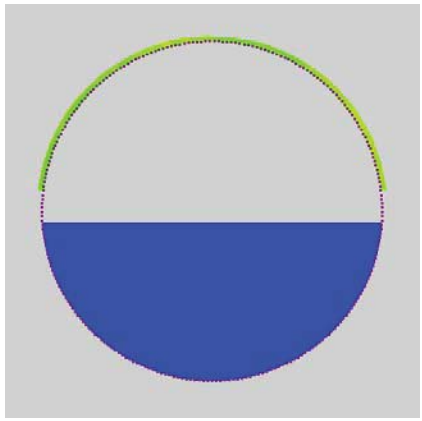

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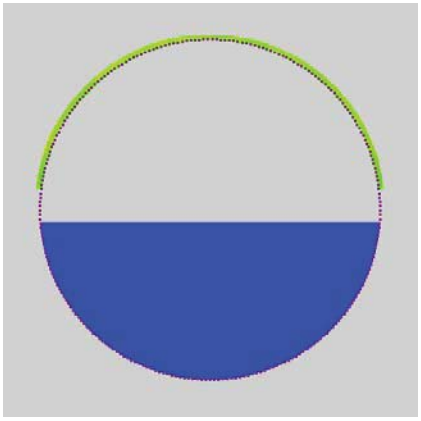

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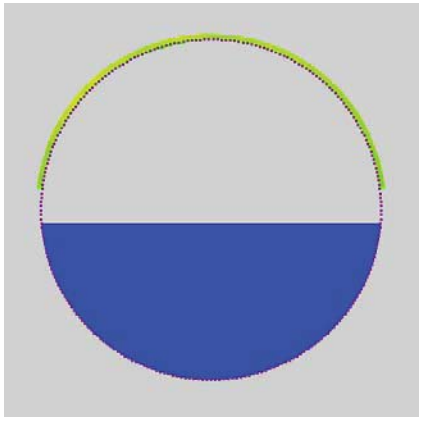

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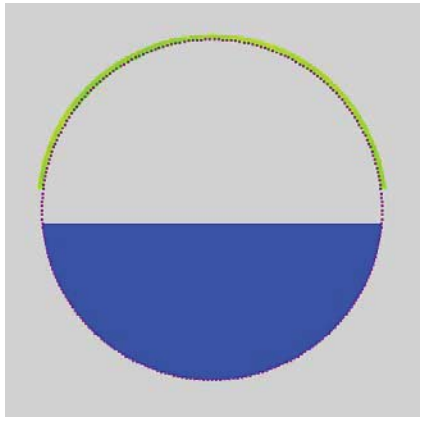

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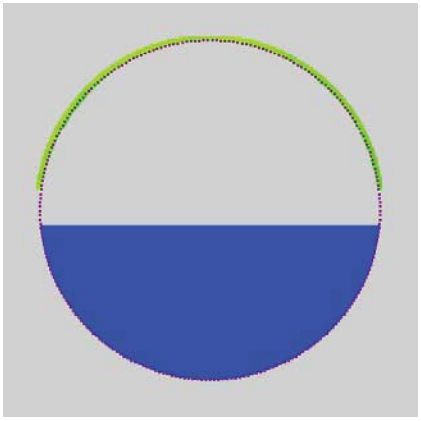

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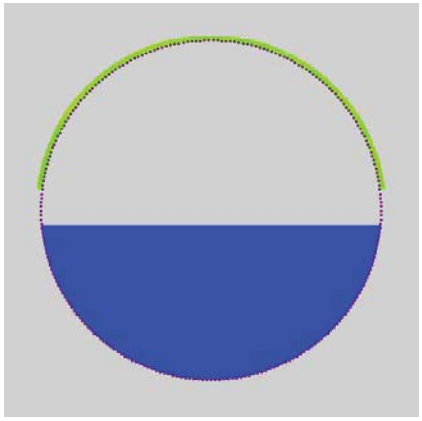

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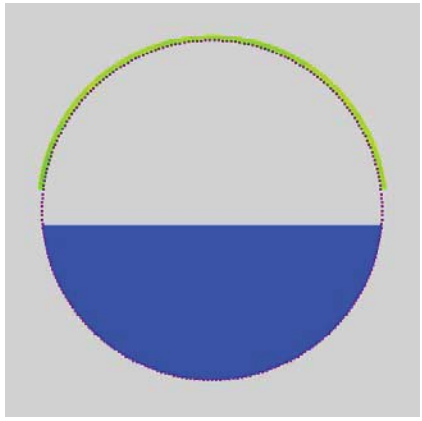

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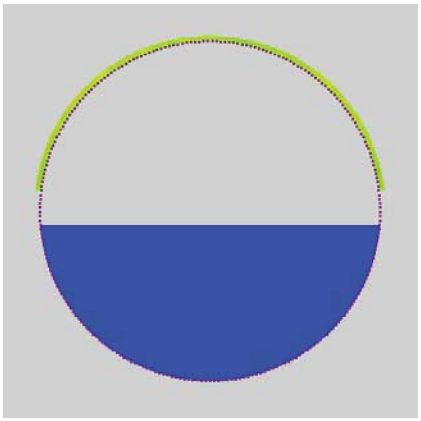

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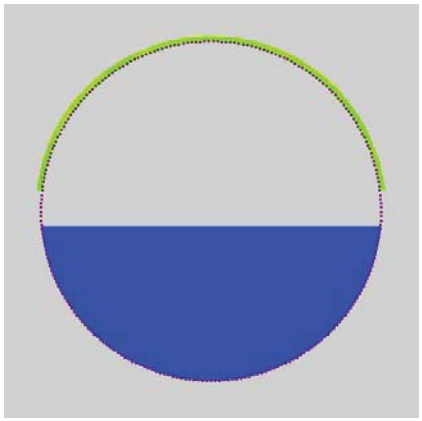

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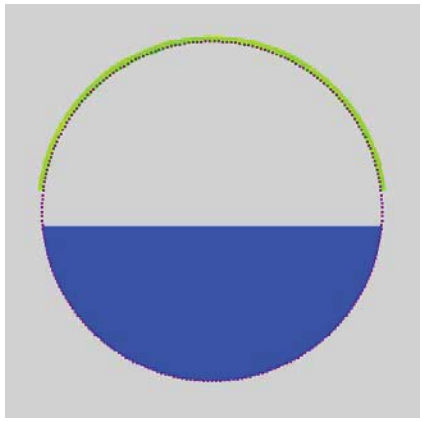

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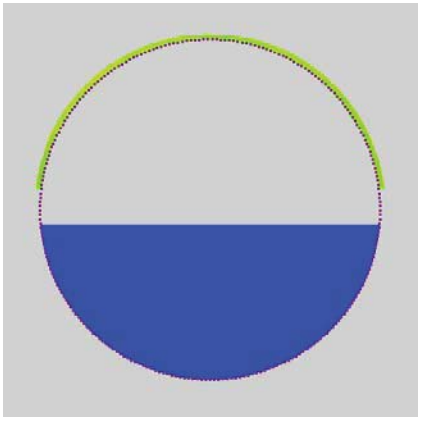

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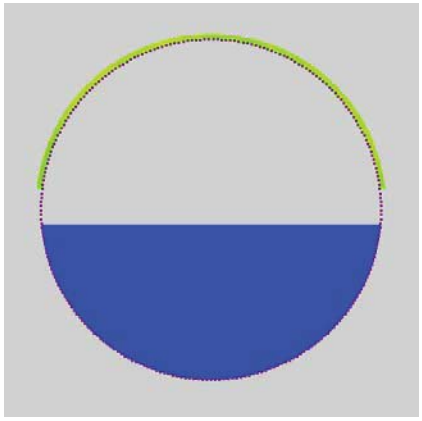

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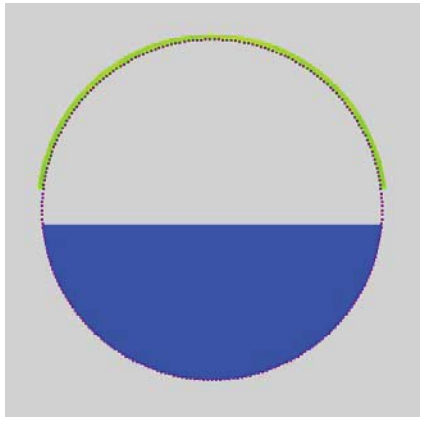

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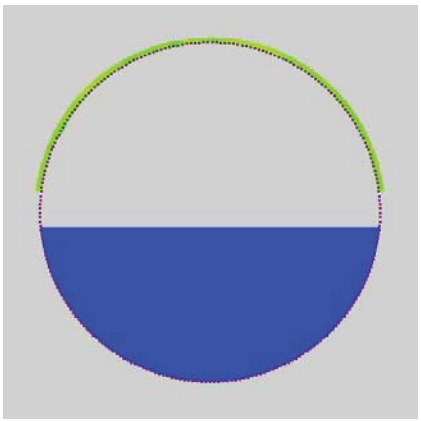

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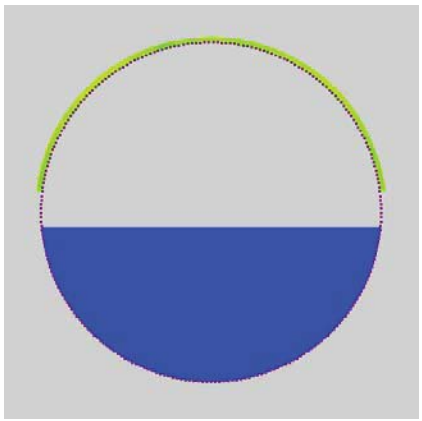

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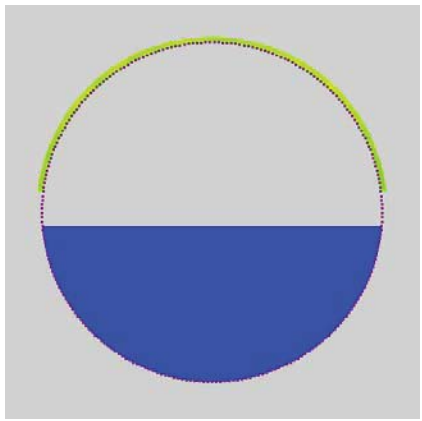

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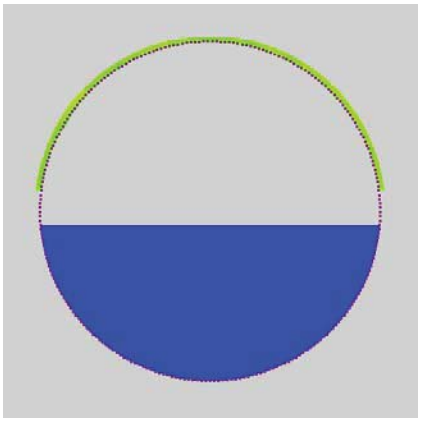

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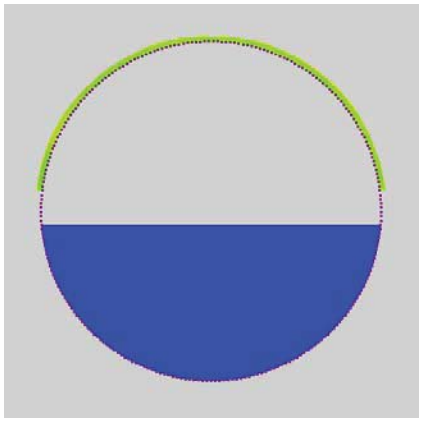

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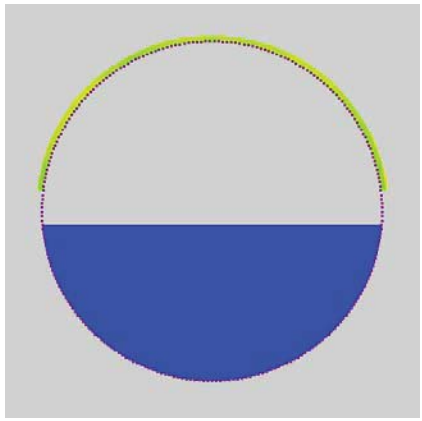

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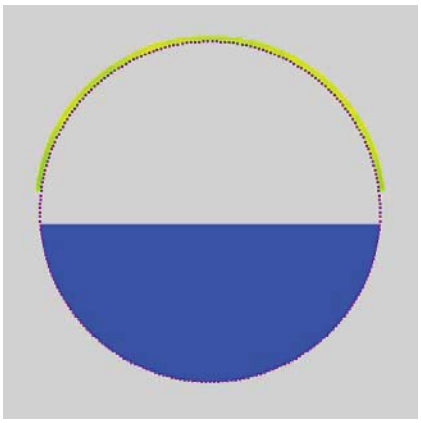

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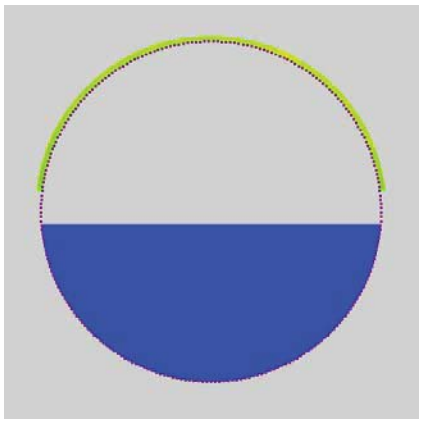

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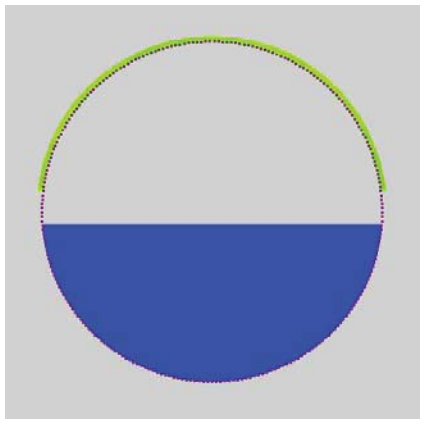

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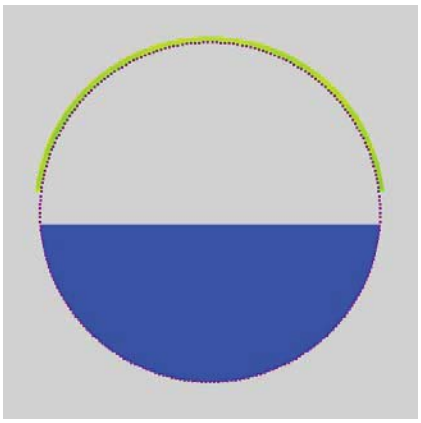

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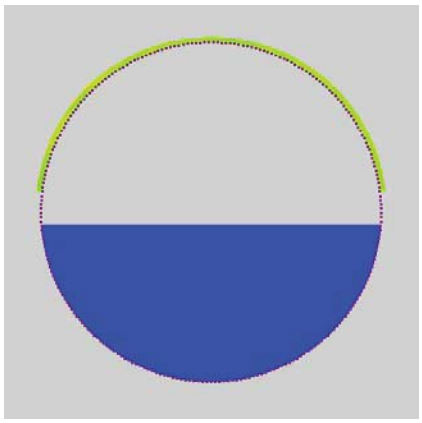

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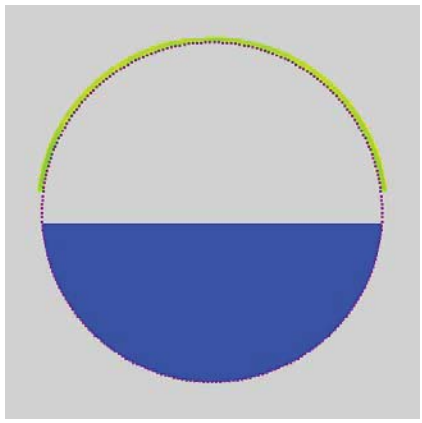

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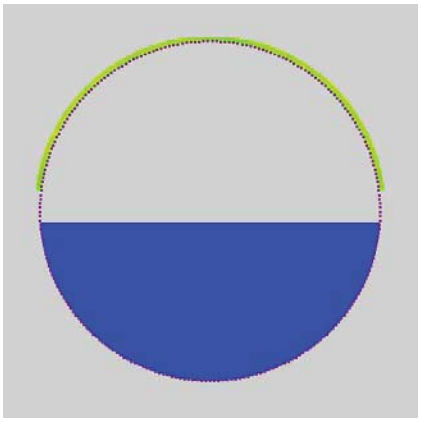

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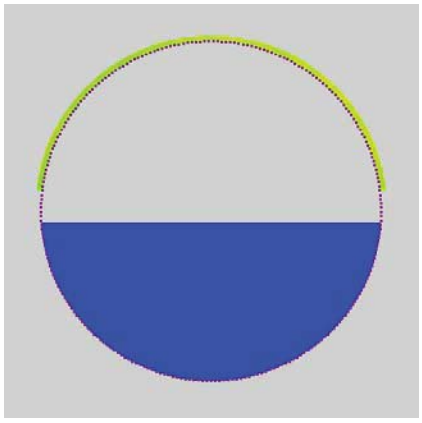

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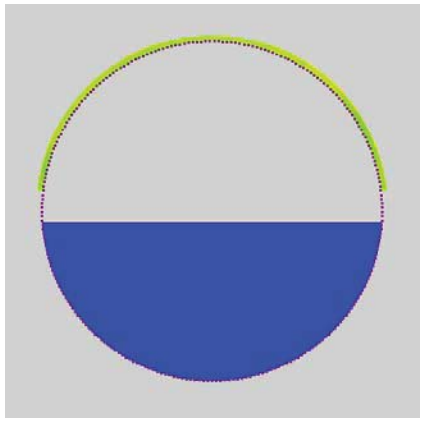

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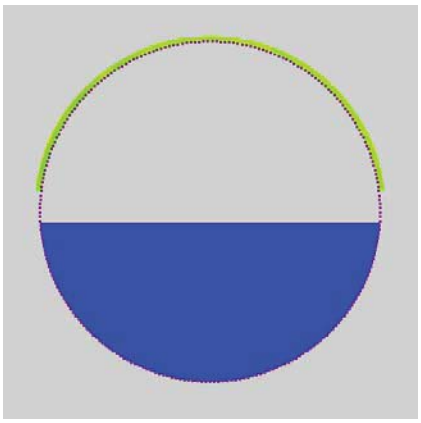

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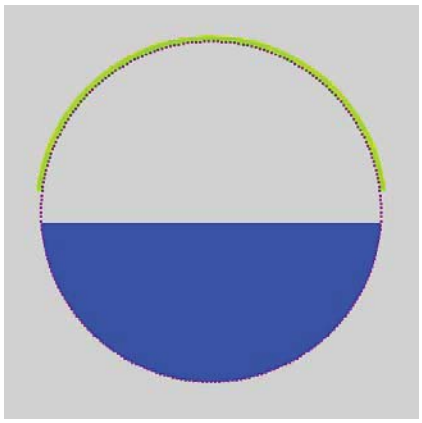

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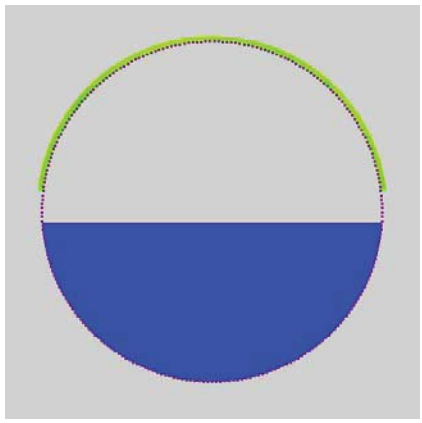

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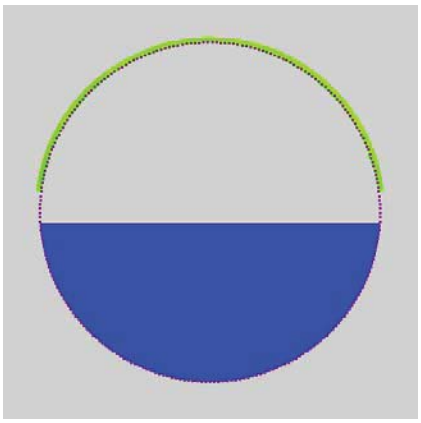

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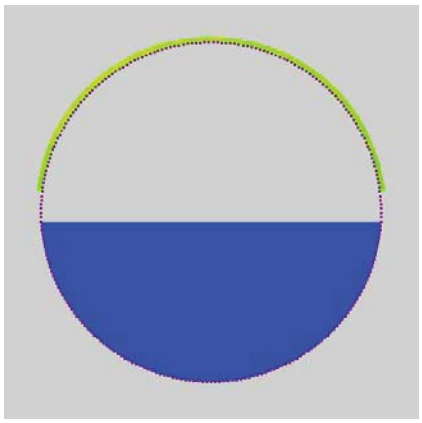

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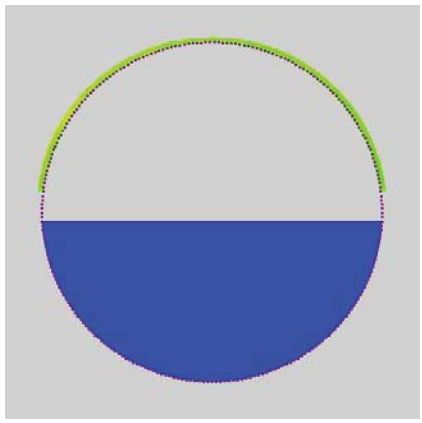

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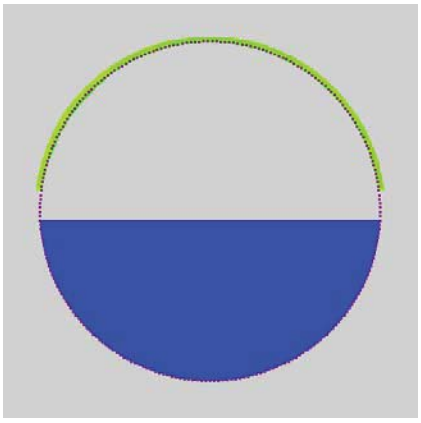

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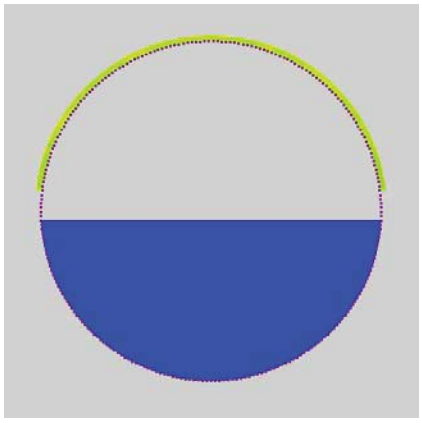

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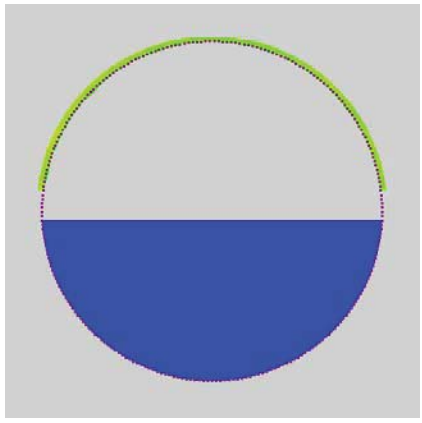

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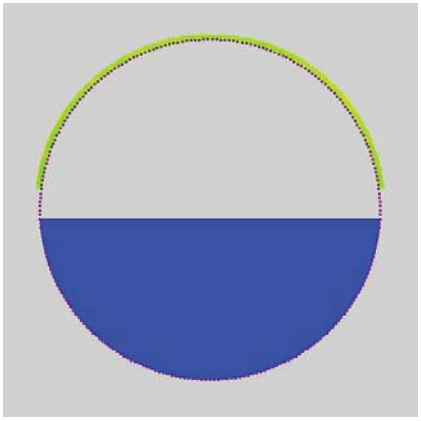

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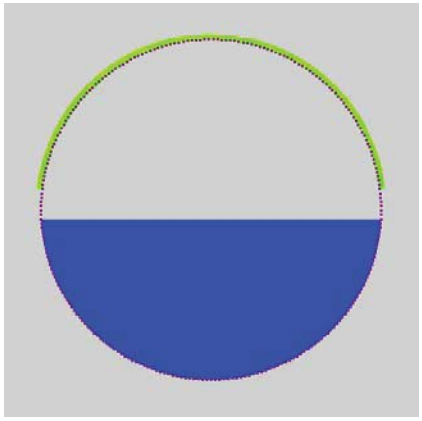

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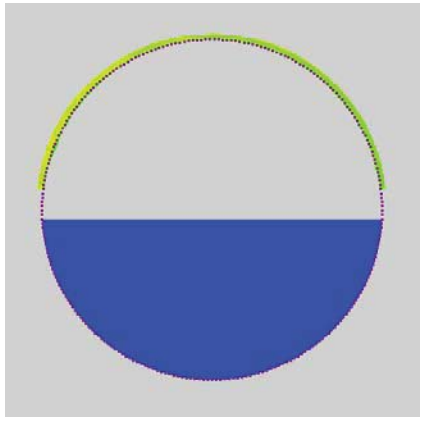

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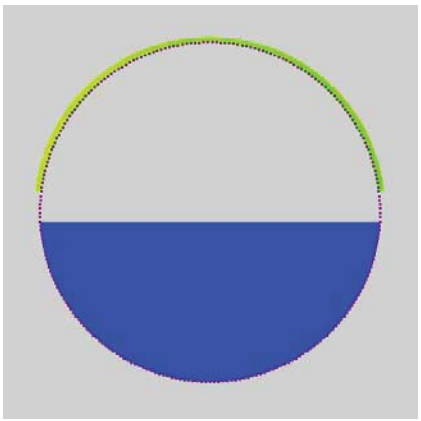

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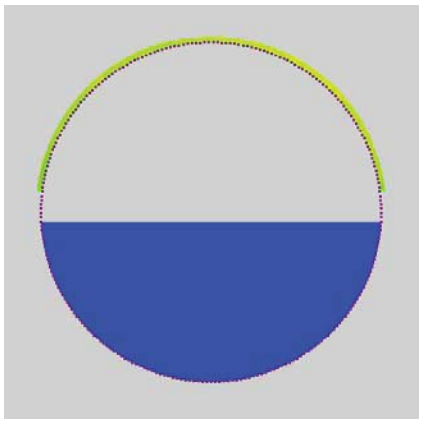

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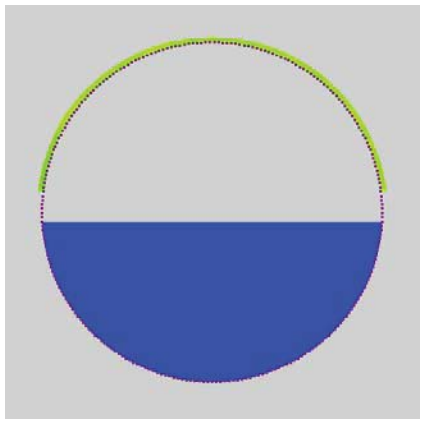

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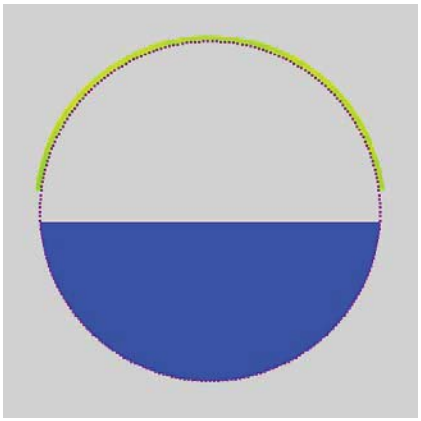

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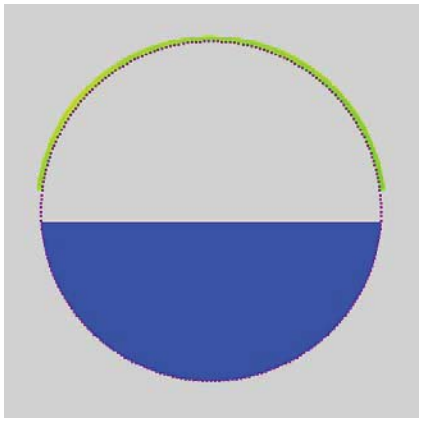

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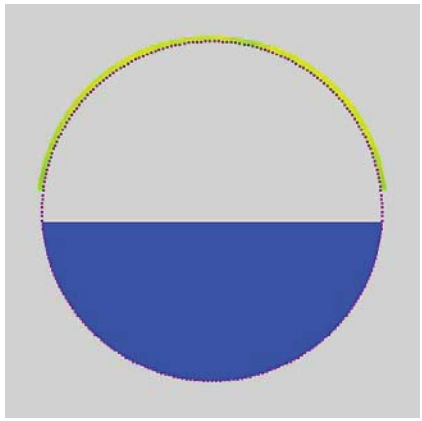

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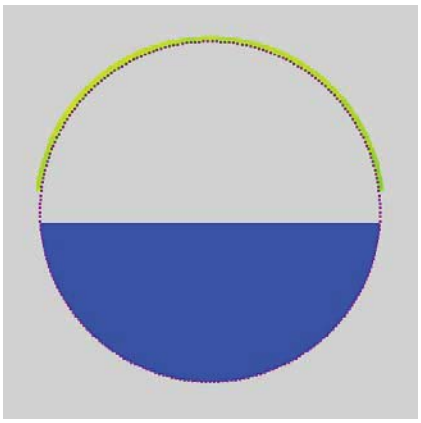

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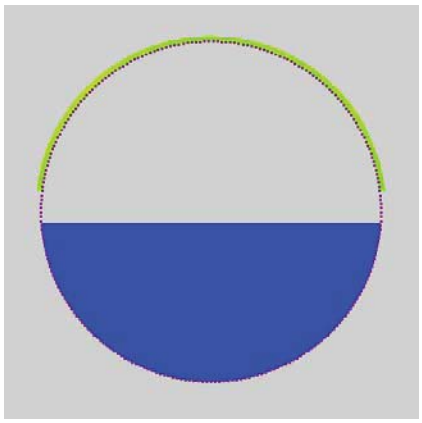

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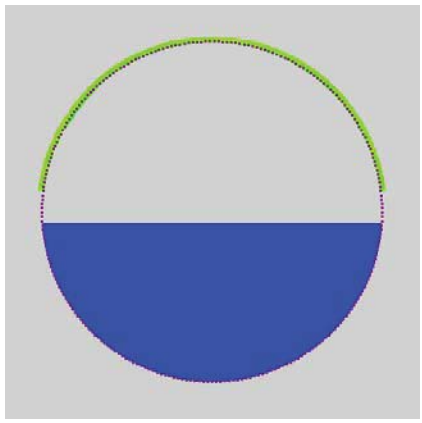

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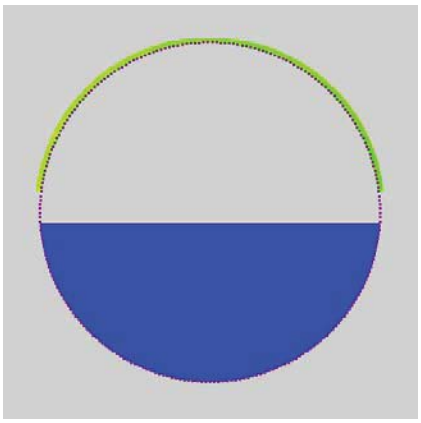

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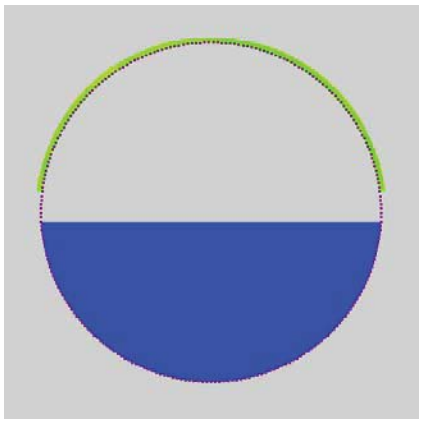

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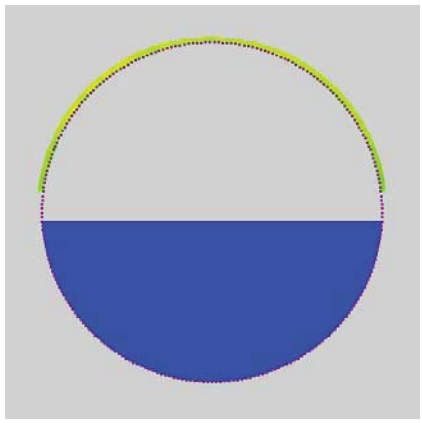

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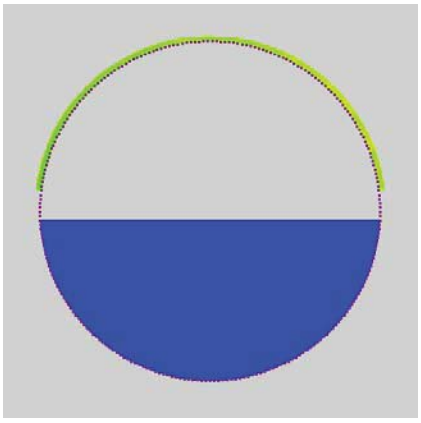

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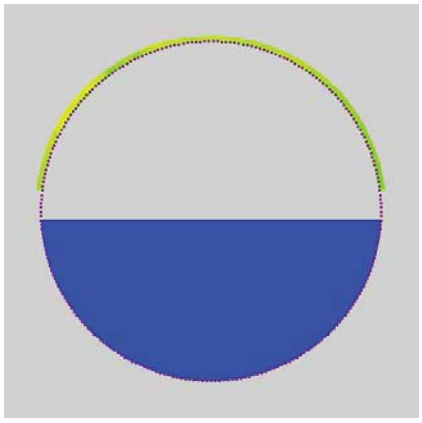

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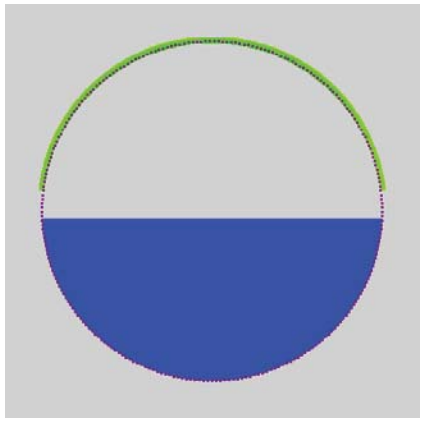

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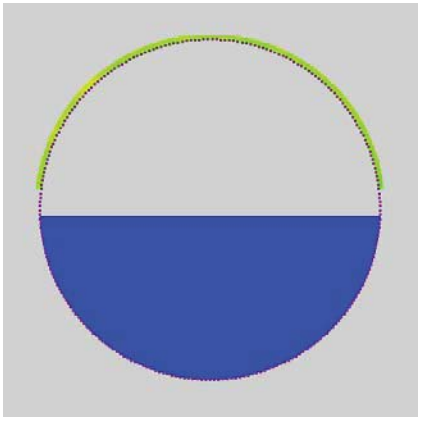

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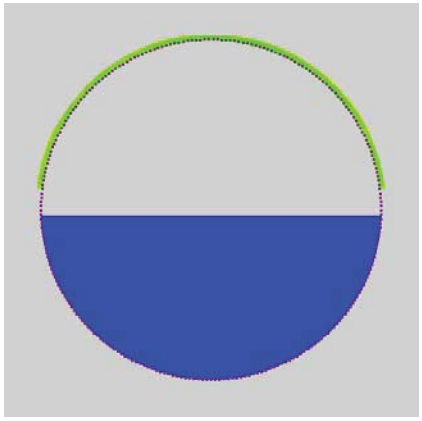

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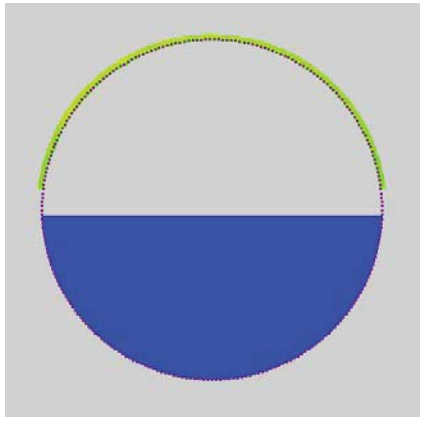

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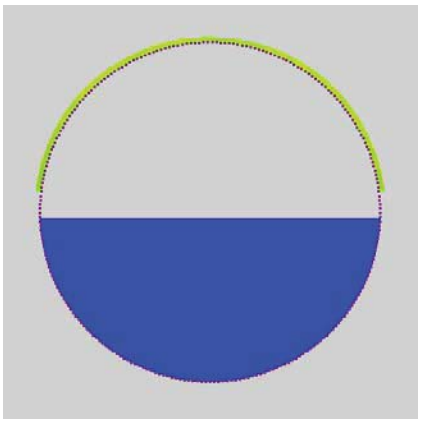

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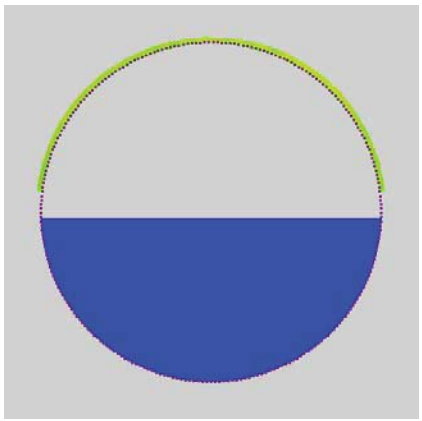

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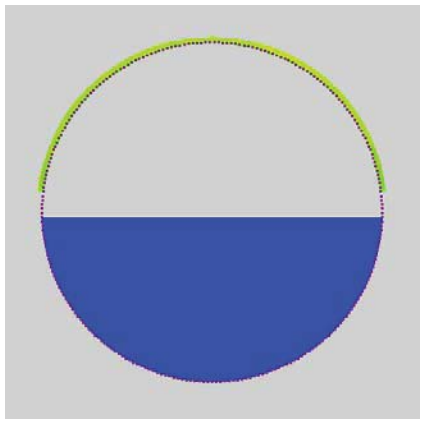

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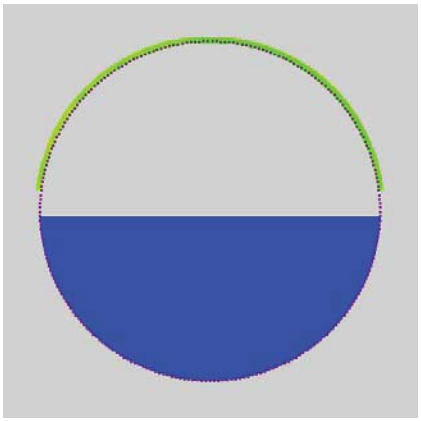

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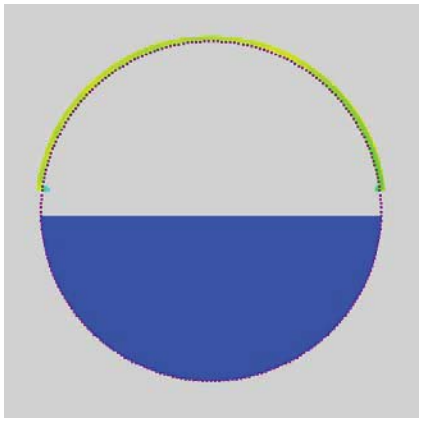

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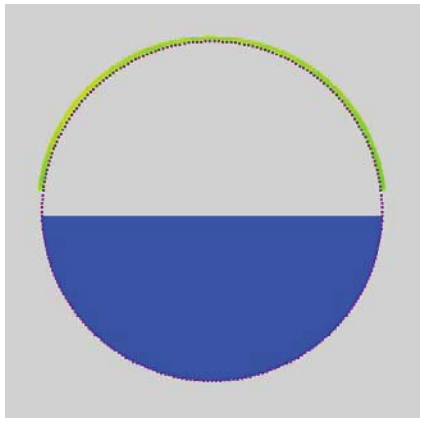

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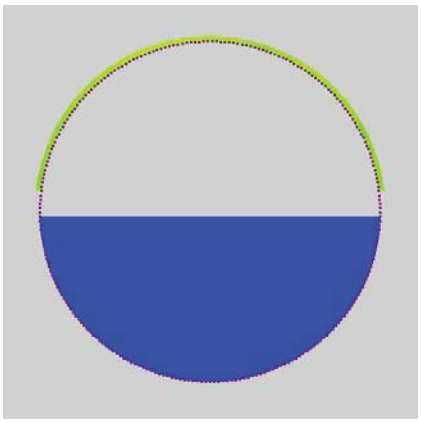

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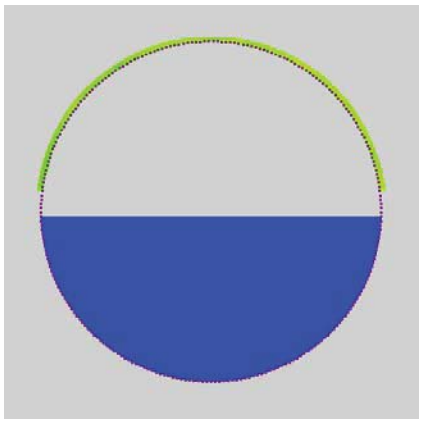

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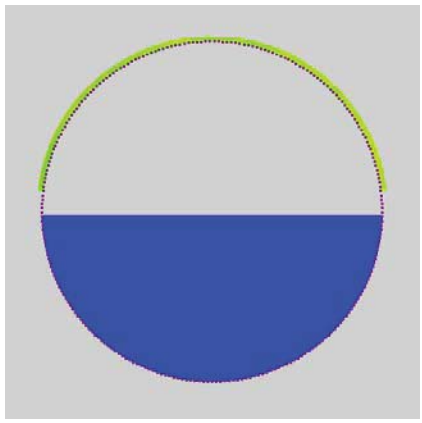

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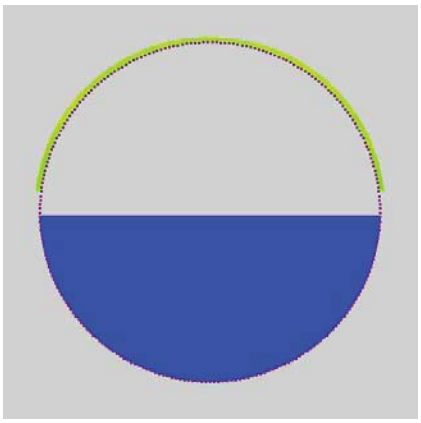

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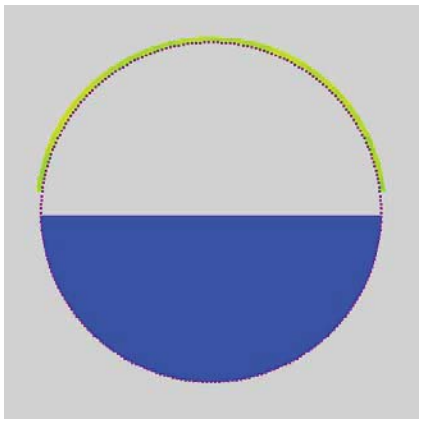

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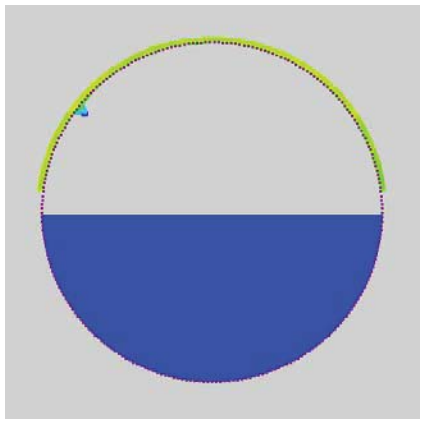

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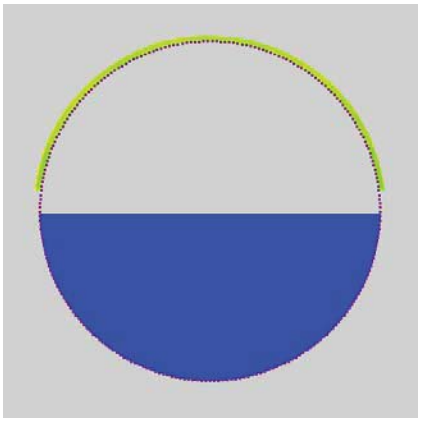

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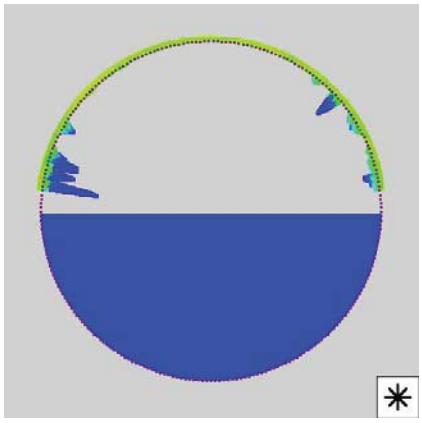

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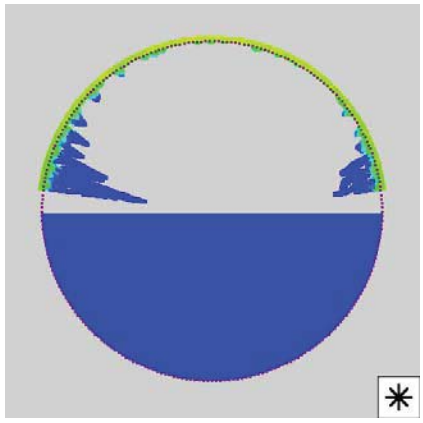

1198ft	1206ft