

An aerial photograph showing a wide river or canal flowing through a landscape. To the right of the water is a multi-lane highway with several vehicles. On the left side of the river, there are some buildings and trees. The text is overlaid in red on the image.

Massillon Levee Pipe Inspection
Final Report
February 4, 2010

By

Pipeline and Drainage Consultants
Subsidiary of Spartan Construction

Arch Avenue Pump Station

Pump Station

Discharge Well/Outlet

Gravity Conduit Outlet

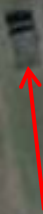


Sippo Creek Pump Station

Outlet box



Pump station



Pump station inlet





James Avenue Pump Station/ Opposite Gravity Culverts

Pump Station Discharge Well/outlet

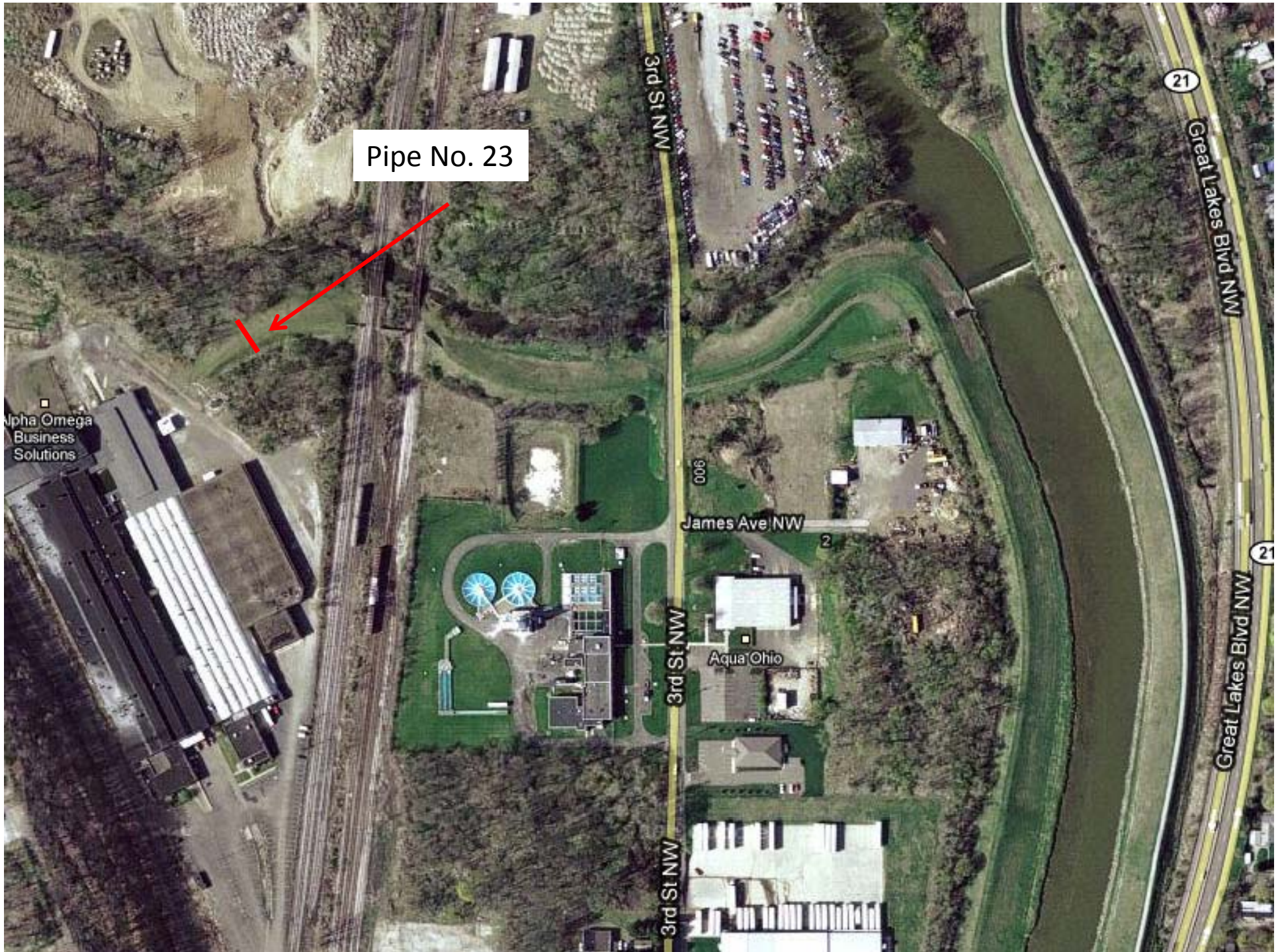
Pump Station

Pipe #26 Gatewell/outlet

Pipe #27 Inlet

Pipe #27

Pipe # 26 inlet



Pipe No. 23

Alpha Omega
Business
Solutions

James Ave NW

Aqua Ohio

21

Great Lakes Blvd NW

21

Great Lakes Blvd NW

3rd St NW

3rd St NW

3rd St NW

006

2

Pipe #25

On culvert thru West Bank Levee opposite Croose Avenue, 1000 ft
upstream of Cherry Road

inlet

Gatewell/outlet





Brookfield siphon inlet

Wooster siphon inlet

Brookfield siphon outlet

Wooster siphon outlet



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue, 1000 ft upstream of Cherry Rd.
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCP	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

Army Corp of Engineers
Rating Guidelines for Levee Inspection

Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
8. Monolith Joints	A	The joint material is in good condition. The exterior joint sealant is intact and cracking/ desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	
	M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	
	U	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
	N/A	There are no monolith joints in the interior drainage system.	
9. Culverts/Discharge Pipes ¹	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Interior Drainage System



Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
17. Intake and Discharge Pipelines	A	Intake and discharge pipelines have no corrosion and paint is intact, except for minor touch up required. Pipe couplings and anchors have no leakage or corrosion.	
	M	Intake and discharge pipelines have minor corrosion and repair and painting is required. Pipe coupling with anchors have minor leakage, corrosion and require bolts to be tightened.	
	U	Intake and discharge pipelines have major corrosion and replacement is required. Pipe coupling with anchors have major leakage and is heavily corroded and requires replacement.	
18. Sluice/ Slide Gates ¹	A	Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.	
	M	Gates and/or operators have been damaged or have minor corrosion, and open and close with resistance or binding. Leakage quantity is controllable, but maintenance is required. Sill is free of sediment and other obstructions.	
	U	Gates do not open or close and/or operators do not function. Gate, stem, lifter and/or guides may be damaged or have major corrosion.	
	N/A	There are no sluice/ slide gates.	
19. Flap Gates/ Flap Valves/ Pinch Valves ²	A	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	
	M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
	U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
	N/A	There are no gates on discharge lines from pump station.	
20. Cranes ²	A	Cranes operational and have been inspected and load tested in accordance with applicable standards within the last year. Documentation is on hand.	
	M	Cranes have not been inspected or operationally tested within the past year, or there are visible signs of corrosion, oil leakage, etc, requiring maintenance.	
	U	Cranes are not operational, and this may prevent the pump station from functioning as required. No documentation available on cranes.	
	N/A	There are no cranes.	
21. Other Metallic Items (Equipment, Ladders, Platform, Anchors, etc)	A	All metal parts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.	
	M	Corrosion seen on metallic parts appears to be maintainable.	
	U	Metallic parts are severely corroded and require replacement to prevent failure, equipment damage, or safety issues.	
	N/A	There are no other significant metallic items.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ Proper operation of the gates (full open and closed) must be demonstrated during the inspection if no documentation is available. Be aware of both manual and electrical operators.

² Proper operation of this item must be demonstrated during the inspection.

Grading of Defects

- All PACP defects assigned a grade from 1 to 5
 - 5 – Immediate Attention – Defect requires immediate attention
 - 4 – Poor – Severe defects that will become Grade 5 defects within the near future
 - 3 – Fair – Moderate defects that will continue to deteriorate
 - 2 – Good – Defects that have not begun to deteriorate
 - 1 – Excellent – Minor defects.

Defect Grades – Express Likelihood of Failure

- 5 – Pipe has failed or will likely fail within the next 5 years
- 4 – Pipe will probably fail in 5 to 10 years
- 3 – Pipe may fail in 10 to 20 years
- 2 – Pipe unlikely to fail for at least 20 years
- 1 – Failure unlikely in the foreseeable future

Pipe Inspection Summary

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location	Corp Rating	PACP Rating	Summary	Discussion/Recommendations
23	18	RCP	103	West of RR with Flap Gate	U	5	Outlet manhole severely deteriorated, partially collapsed during testing, significant amount of root intrusion, several joints offset throughout the structure.	Manhole severely deteriorated and needs to be replaced. Roots need to be removed and pipe needs to be sealed/grouted or lined.
24	12	RCP?	175	Could not locate/unknown/does not exist				
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue, 1000 ft upstream of Cherry Rd.	U	5	Inlet was completely buried and plugged. Significant joint leakage was occurring at the third joint from the inlet. Water continued to discharge from the joint for several weeks after cleaning.	Consideration should be given to adding a box and drop grate near at the inlet, or grated inlet. Joint should be sealed. Water source infiltrating into the structure should be located.
26	66	RCP	93	Culvert through East Bank Levee near control weir	M	5	Several joints offset throughout the structure, several joints broken, moisture present at several joints, pipe possibly starting show distress from water moving outside the structure.	Pipe joint should be sealed, damaged joint should be repaired. Structure may need to be lined.
27	42	DIP to RCP	360	At inlet to siphon control weir	U	5	DIP moderately corroded, several stained and leaking joints in RCP pipe. Heavy flow from joint at 173 feet. Radial and diagonal cracking noted in several areas along upstream side of the structure.	Manual entry was limited due to low oxygen levels in the pipe at the time of the inspection, unsure on voids at joints, Inlet grate severely corroded, no coating on the DIP, several stained in RCP. Inlet grate should be repaired, DIP should be recoated, and the joints in the RCP should be patched and sealed. Soundings should be conducted in areas of high infiltration.
28	48	RCP	97	James Avenue Pump Station Gravity Outlet	M	4	Sagging visible from inlet to gatewell, joint more open on bottom, several joint weeping water.	Pipe joints should be sealed.
29	30	CIP	100	Discharge from James Avenue Pump Station	M	4	All three pipes have moderate to severe corrosion at the joints. Missing protective coating was missing not only at the joints but in flat areas and sharp bends. It appears that point repairs of the protective coating have been made in sections.	Recommend air pressure testing to verify the integrity of the joints, areas of missing protective coating should be repaired prior to additional degradation.
30	30	CIP	100	Discharge from James Avenue Pump Station	M	4		
31	30	CIP	100	Discharge from James Avenue Pump Station	M	4		

Pipes	Size (Inches)	Material	Length (Feet)	Location	Corp Rating	PACP Rating	Summary	Discussion/Recommendations
32	60	RCP	135	Federal Avenue Pump Station Outlet	A-M	3 to 4	0-42 feet CMP, CMP bituminous coating missing in haunches, moderate corrosion, RCP 42 to gatewell appears to be in good condition, moisture present at some of the joints.	The CMP is starting to show signs of moderate to significant corrosion in areas, most of the paved invert is missing.
33	60	RCP	135	Federal Avenue Pump Station Outlet	A-M	3 to 4	0-42 feet CMP, CMP bituminous coating missing in haunches, moderate corrosion, RCP 42 to gatewell appears to be in good condition, moisture present at some of the joints.	
34	30	CIP	141	Discharge from Federal Avenue Pump Station	M	4	All three pipes have moderate to severe corrosion at the joints, missing protective coating also noted in flat areas and bends. It appears in some sections point repairs have been made on the protective coating.	Recommend air pressure testing to verify the integrity of the joints, areas of missing protective coating should be repaired prior to additional degradation.
35	30	CIP	141	Discharge from Federal Avenue Pump Station	M	4		
36	30	CIP	141	Discharge from Federal Avenue Pump Station	M	4		
37	15'X10'	RCB	120	Sippo Creek Pump Station	M	3 to 4	Most of the joints appear to have some weeping and/or signs of staining at the joints. Invert is rough in areas indicating moderate scouring. Rebar exposed and some spalling noticed in areas.	Recommend that the joints be repaired and sealed.
38	24	CIP	5	Discharge from Sippo Creek Pump Station	M	4	All three pipes have moderate to severe corrosion at the joints, missing protective coating also noted in the inverts and haunches of the pipes. Pipe #39 has a severe offset joint with potential leakage.	Recommend air pressure testing to verify the integrity of the joints, areas of missing protective coating should be repaired prior to additional degradation.
39	24	CIP	10	Discharge from Sippo Creek Pump Station	M	4		
40	24	CIP	20	Discharge from Sippo Creek Pump Station	M	4		

Pipes	Size (Inches)	Material	Length (Feet)	Location	Corp Rating	PACP Rating	Summary	Discussion/Recommendations
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station	M	3 to 4	Offset joint in crown of box at 23 ft, spalling in crown near gatewell, last section of pipe at (80 ft) outlet is offset and leaking, signs of potential soil movement.	All joints should be cleaned, resealed, and repaired if need. Offset joints should be evaluated for potential voids and pressure grouted if necessary.
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station	M	3 to 4	Water movement at entrance in crown and headwall, open joints between barrels, moisture present in some of the joints, offset joint in box at gatewell, last section of pipe at outlet is offset and leaking, signs of potential soil movement.	All joints should be cleaned, resealed, and repaired if need. Offset joints should be evaluated for potential voids and pressure grouted if necessary.
43	24	CIP	85	Discharge from Arch Avenue Pump Station	M	4	All three pipes have moderate to severe corrosion at the joints, missing protective coating also noted in the flat areas and flat bends.	Recommend air pressure testing to verify the integrity of the joints, areas of missing protective coating should be repaired prior to additional degradation.
44	24	CIP	85	Discharge from Arch Avenue Pump Station	M	4		
45	24	CIP	85	Discharge from Arch Avenue Pump Station	M	4		
46	48	RCP	90	Gravity Conduit through levee	A-M	3	Pipe is showing some signs of settlement could be due to movement of water under neath the structure caused by the up gradient CMP structure.	The CMP upstream line should be replaced or lined. Concern is that settlement is noticeable in the down stream line under the levee. Unsure if water moving outside the CMP may be flowing around the manhole and under the downstream structure potential causing the observed settlement.
46b	48	CMP	317	Gravity Conduit MH upstream of Levee	U	5	CMP structure is severely corroded, invert missing, pipe starting to deflect. Unsure how much water is moving outside/under the structure.	
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor	A-M	3	Minor corrosion at the joints, protective coating coming off in sheets in several areas. No gate valves/cut off valves were installed on the system.	All three pipes are showing minor to moderate loss of the protective coating, material coming off in sheets. System design did not allow for Sonar or entire pipe to be camera inspected. It is anticipated that additional heavy cleaning would degrade the life of the pipe through removal of the protective coating.
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor	A-M	3		
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor	A-M	3		
50	18	DIP	460	Siphon-Conduit-Wooster Trunk	M-U	4	Gate valves for Pipe No. 51 and 52 were frozen mid position, Gate valve for No. 50 difficult to turn. Pipe 51 and 52 could not be inspected. Pipe not 50 was severely corroded above the waterline.	Due to the limited inspection and the poor condition of the pipe that was inspected, and the difficulties of maintaining and inspecting the siphons consideration of replacing the siphon with a pump station should be weighed vs repairing several of the siphons.
51	10	DIP	460	Siphon-Conduit-Wooster Trunk	M-U	4		
52	15	DIP	460	Siphon-Conduit-Wooster Trunk	M-U	4		
53	8	VCP	450	Siphon-Conduit-Tuscarawas River	M-U	5	Gate valves were broken on both pipes, diversion board on inlet was rotted through. Metal pipe at gate valves severely corroded.	Due to the limited inspection and the poor condition of the pipe that was inspected, and the difficulties of maintaining and inspecting the siphons consideration of replacing the siphons with a pump station should be weighed vs repairing several of the siphons.
54	10	VCP	450	Siphon-Conduit-Tuscarawas River	M-U	4	Significant offset/and or debris build up at outlet of Pipe 53, several offset joints in Pipe No. 54.	

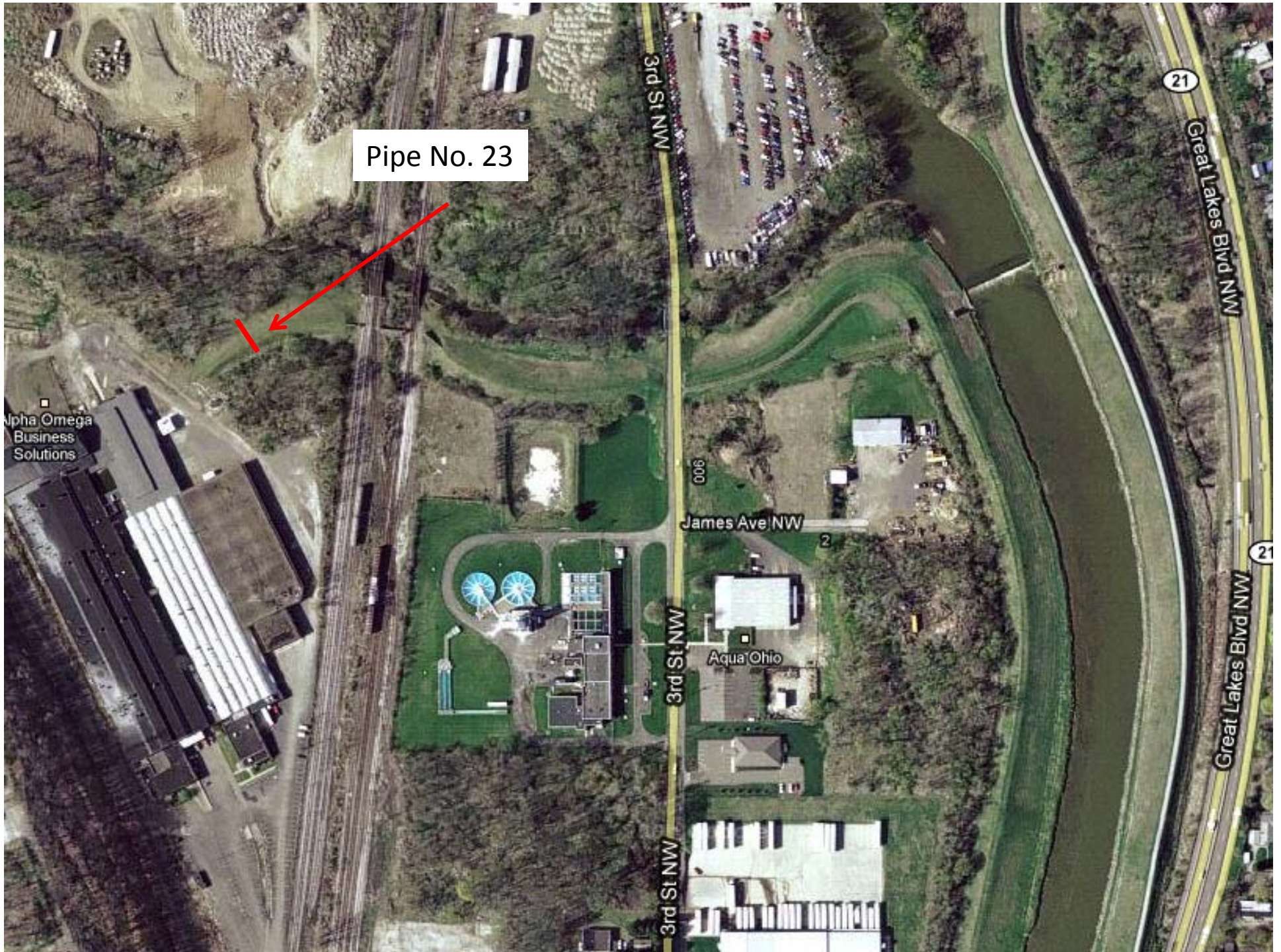
Pipe No. 23

18-Inch Storm Drain



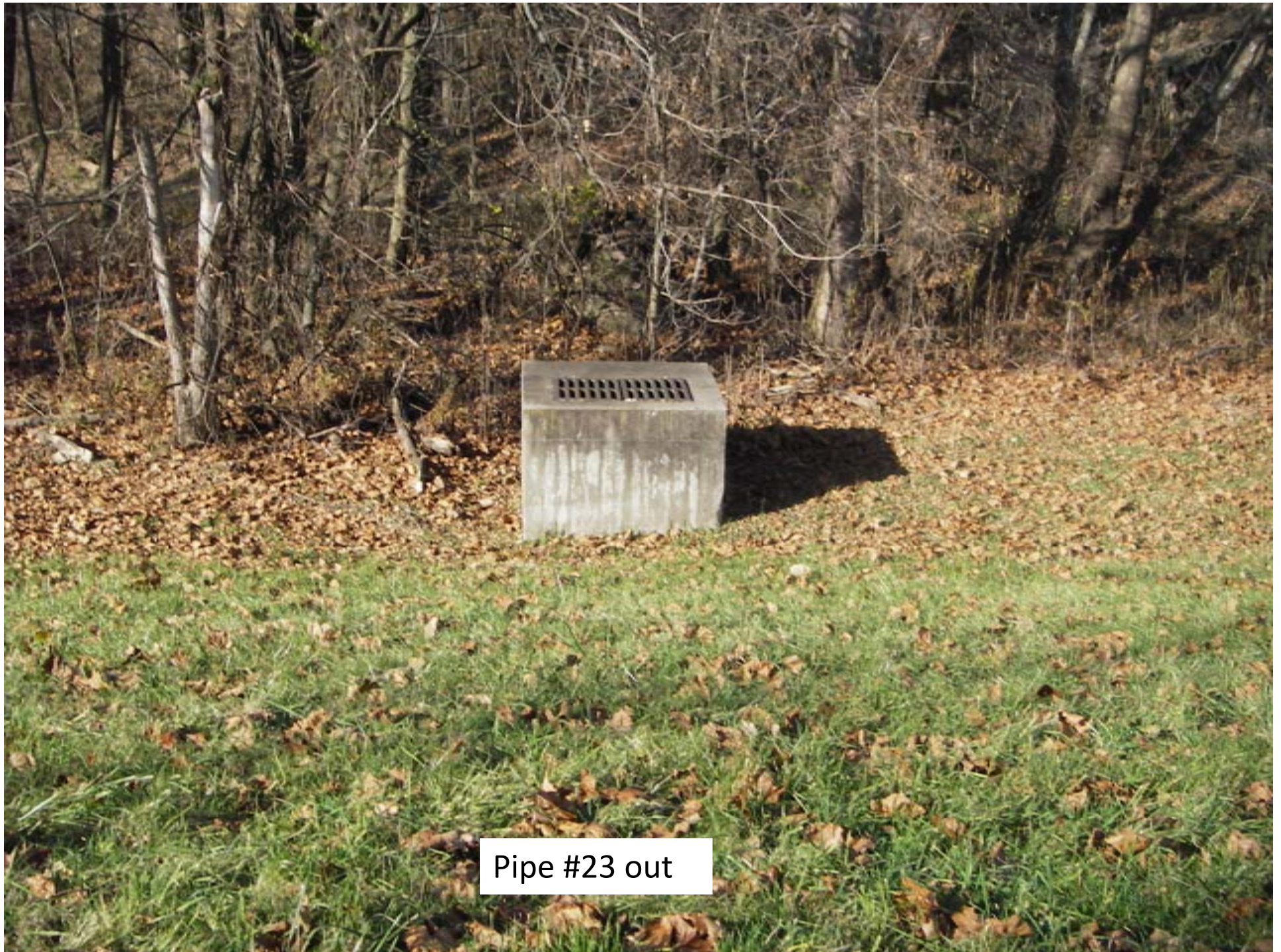
Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCP	120	Sippo Avenue Pump Station
38	24	CIP	5	Discharge from Sippo Avenue Pump Station
39	24	CIP	10	Discharge from Sippo Avenue Pump Station
40	24	CIP	20	Discharge from Sippo Avenue Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River



A photograph of a grassy embankment, likely a levee, covered in fallen brown leaves. In the background, there is a dense line of bare trees under a clear blue sky. A small, rectangular concrete structure is visible on the left side of the embankment.

Levee at pipe #23



Pipe #23 out

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133

CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: 23 PIPE SIZE: 18" LENGTH INSPECTED: Approximately 103ft

PROJECT: Massillon Levee TYPE: RCP or Clay INSPECTION DATE: 9/16/09

OVERALL CONDITION: **NASSCO Grade 5: Manhole is currently failing/failed**

GENERAL INSPECTION FINDING: Manhole severely deteriorated. Manhole partially collapsed during testing. Significant amount of root intrusion towards the inlet end of the structure. Several joint throughout the structure offset.

MAJOR DEFECTS

Pipe #23 West of Rail Road	
Feet	Defect
2.2ft	Offset joint at invert
3.8ft	Roots coming through joints at invert
4.7ft	Roots coming through joint at approx. 9 o'clock
11.2ft	Roots completely covering joint at right haunch, approx. 2" joint separation at invert
19.8ft	1.5" joint separation at left haunch
76.5ft	2" joint separation at approx. 3 o'clock
80.8ft	Sediment covering invert
88.3ft	1.5" joint separation at approx. 3 o'clock
94.3ft	Approx. 2" joint separation right haunch
103 ft	Manhole, significant deterioration



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

NASSCO PACP Condition Grading System Code Matrix

Family	Group	Descriptor	Modifier	Code	Structural Grade	O&M Grade
		Other (Z)		DNZ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
O&M	Roots (R)	Fine (F)	Barrel (B)	RFB		2
			Lateral (L)	RFL		1
			Connection (C)	RFC		1
	Roots (R) at a Joint		N/A	RF		1
		Tap (T)	Barrel (B)	RTB		3
			Lateral (L)	RTL		2
			Connection (C)	RTC		2
	Roots (R) at a Joint		N/A	RT		2
		Medium (M)	Barrel (B)	RMB		4
			Lateral (L)	RML		3
			Connection (C)	RMC		3
	Roots (R) at a Joint		N/A	RM		3
		Ball (B)	Barrel (B)	RBB		5
			Lateral (L)	RBL		4
			Connection (C)	RBC		4
	Roots (R) at a Joint		N/A	RB		4
O&M	Infiltration (I)	Weeper (W)		IW		2
		Dripper (D)		ID		3
		Runner (R)		IR		4
		Gusher (G)		IG		5
O&M	Obstacles/Obstructions (OB)	Brick or Masonry (B)		OBB		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Pipe Material in Invert (M)		OBM		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Protruding Thru Wall (I)		OBI		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Wedged in Joint (J)		OBJ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Thru Connection (C)		OBC		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5

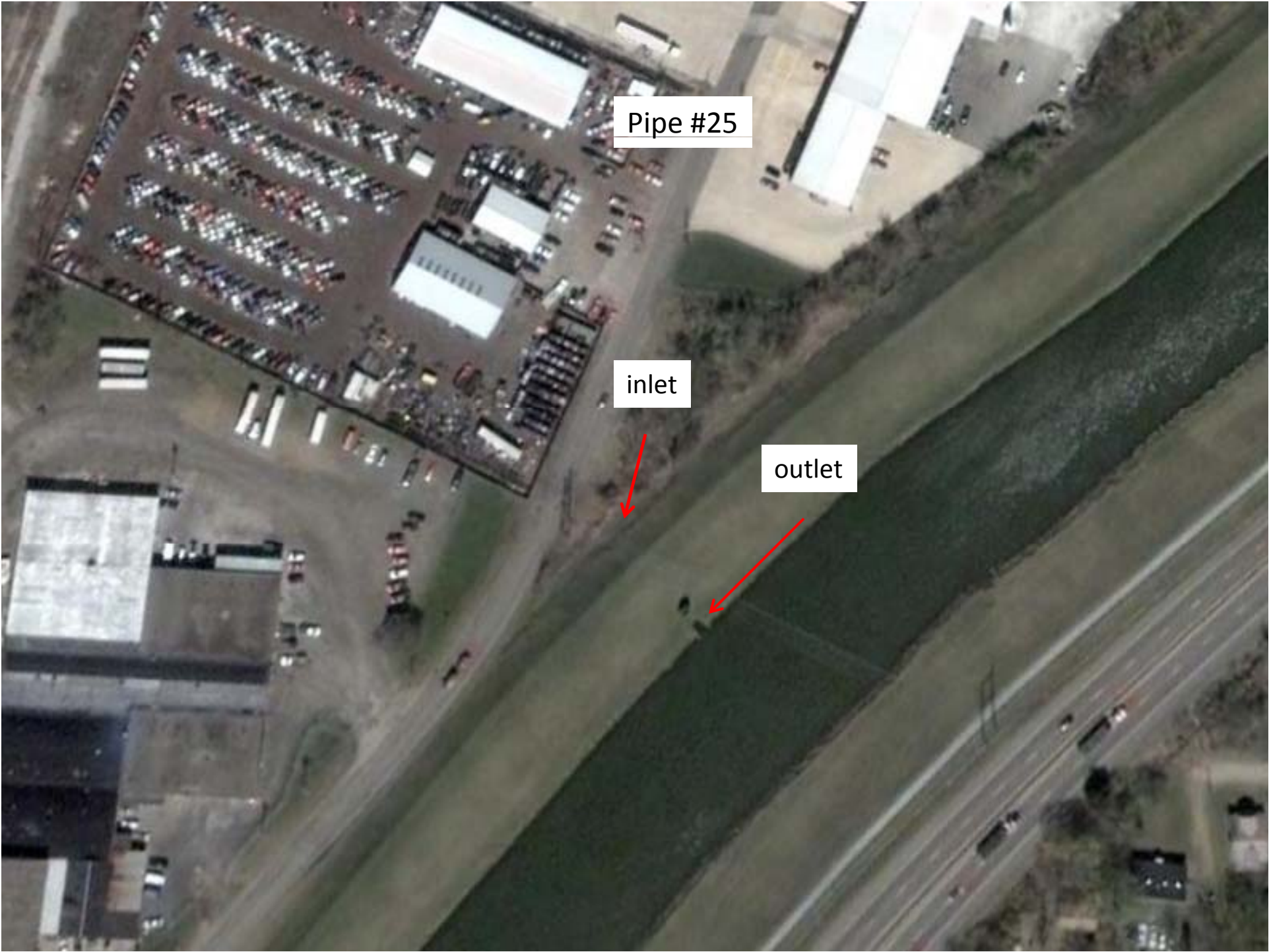
Pipe No. 25

42-Inch RCP Storm Drain



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River



Pipe #25

This is an aerial photograph of an industrial facility. In the upper left, there is a large parking lot filled with many cars. To the right of the parking lot are several large, white industrial buildings. A river flows from the top right towards the bottom right of the image. A multi-lane highway runs along the bottom right edge. Two red arrows point to specific locations in the river: one labeled 'inlet' and another labeled 'outlet'. The 'inlet' is located near the industrial buildings, and the 'outlet' is further downstream. The text 'Pipe #25' is located near the top center of the image.

inlet

outlet

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133

CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: 25 PIPE SIZE: 42" LENGTH INSPECTED: Approximately 95ft
PROJECT: Massillon Levee TYPE: RCP INSPECTION DATE: 10/30/09

OVERALL CONDITION: **NASSCO Grade 5 – Defect requires immediate attention**

GENERAL INSPECTION FINDING: Inlet was completely buried and plugged. Significant joint leakage was occurring at the third joint from the inlet. **Water continued to discharge from the joint for several weeks**, Unsure of the water source. Joint material rolled from joint in several areas. Invert to springline appears to be grouted. Outlet end from gatewell to headwall could not be inspected.

MAJOR DEFECTS

Pipe #25	
Feet	Defect
3.7ft	Offset joint, gasket rolled
10.8ft	Significant leakage at joint, running for several weeks
15.1ft	Staining at joint
19.1ft	Diagonal crack in bell
22.4ft	Staining at joint
31ft	Staining at joint
46.9 ft	Gasket rolled
78.9ft	Crack through bell



NASSCO PACP Condition Grading System Code Matrix

Family	Group	Descriptor	Modifier	Code	Structural Grade	O&M Grade
		Other (Z)		DNZ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
O&M	Roots (R)	Fine (F)	Barrel (B)	RFB		2
			Lateral (L)	RFL		1
			Connection (C)	RFC		1
	Roots (R) at a Joint		N/A	RF		1
		Tap (T)	Barrel (B)	RTB		3
			Lateral (L)	RTL		2
			Connection (C)	RTC		2
	Roots (R) at a Joint		N/A	RT		2
		Medium (M)	Barrel (B)	RMB		4
			Lateral (L)	RML		3
			Connection (C)	RMC		3
	Roots (R) at a Joint		N/A	RM		3
		Ball (B)	Barrel (B)	RBB		5
			Lateral (L)	RBL		4
			Connection (C)	RBC		4
	Roots (R) at a Joint		N/A	RB		4
O&M	Infiltration (I)	Weeper (W)		IW		2
		Dripper (D)		ID		3
		Runner (R)		IR		4
		Gusher (G)		IG		5
O&M	Obstacles/Obstructions (OB)	Brick or Masonry (B)		OBB		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Pipe Material in Invert (M)		OBM		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Protruding Thru Wall (I)		OBI		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Wedged in Joint (J)		OBJ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Thru Connection (C)		OBC		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5

Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Pipe No. 26

66-Inch RCP Storm Drain



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River



Pipe No. 26. Culvert through East Bank Levee near control weir

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: 26 PIPE SIZE: 5.5' LENGTH INSPECTED: Approximately 93ft
PROJECT: Massillon Levee TYPE: RCP INSPECTION DATE: 9/16/09

OVERALL CONDITION: **NASSCO Grade 5 – Defects required immediate attention**

GENERAL INSPECTION FINDING: Several joints offset throughout the structure, several joints broken, moisture present at several joints, pipes starting to show possible distress from water moving outside the structure.

MAJOR DEFECTS

Pipe # 26	
Feet	Defect
Start-Outlet	Invert of headwall scoured/eroded and missing, 17" across. 4" depth of invert missing
6ft	Offset joint, cracked, spalled, scoured
12ft	Concrete missing from invert of pipe, entrance into gatewell
21ft	Busted, broken joint. Piece missing from joint/scouring/ 4" joint separation, offset joint , backfill visible
22ft	Spalling/ joint
35ft	Moisture/water flowing @haunch
42ft	Deterioration of joint at invert
46ft	Offset Joint
52ft	1" offset joint
57ft	Spalling at joint
62ft	Seal exposed and being pushed from joint
67ft	Joint seal deteriorating, moisture present at joint
67ft	Wet joint left haunch
73ft	1 ½" joint separation left haunch, moisture present
73ft	4" penetration left haunch
78ft	Scouring of joint at approx. 11 o'clock
83ft	Spalled/broken invert/moisture present
88ft	Spalled/broken invert/moisture present
93ft	Large piece of headwall missing at invert of inlet approx. 36" across



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

NASSCO PACP Condition Grading System Code Matrix

Family	Group	Descriptor	Modifier	Code	Structural Grade	O&M Grade
Structural	Crack (C)	Circumferential (C)		CC	1	
		Longitudinal (L)		CL	2	
		Multiple (M)		CM	3	
		Spiral (S)		CS	2	
Structural	Fracture (F)	Circumferential (C)		FC	2	
		Longitudinal (L)		FL	3	
		Multiple (M)		FM	4	
		Spiral (S)		FS	3	
Structural	Pipe Failures (Silent)	Broken (B)		B	1 clock pos - 3, 2 clock pos - 4, >=3 clock pos - 5	
		Broken (B)	Soil Visible (SV)	BSV	5	
		Broken (B)	Void Visible (V V)	BVV	5	
		Hole (H)		H	1 clock pos - 3, 2 clock pos - 4, >= 3 clock pos - 5	
Structural	Collapse (X)	Hole (H)	Soil Visible (SV)	HSV	5	
		Hole (H)	Void Visible (V V)	HVV	5	
		Pipe (P)		XP	5	
		Brick (B)		XB	5	
Structural	Deformed (D)	(Pipe) (P)		D	<=10% - 4, >10% - 5	
		Brick (B)	Horizontally (H)	DH	5	
		Brick (B)	Vertically (V)	DV	5	
Structural	Joint (J)	Offset (displaced) (O)	Med (M)	JOM	1	
			Large (L)	JOL	2	
		Separated (open) (S)	Med (M)	JSM	1	
			Large (L)	JSL	2	
		Angular (A)	Med (M)	JAM	1	
			Large (L)	JAL	2	
		Surface Damage Chemical (S)				
		Roughness Increased (RI)	C	SRIC	1	
		Surface Spalling (SS)	C	SSSC	2	
		Aggregate Visible (AV)	C	SAVC	3	
		Aggregate Projecting (AP)	C	SAPC	3	
		Aggregate Missing (AM)	C	SAMC	4	
		Reinforcement Visible (RV)	C	SRVC	5	
		Reinforcement Corroded (RC)	C	SRCC	5	

Pipe No. 27

42-Inch RCP Storm Drain/Siphon



Pipes Inspected, Massillon Levee				
Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River



Pipe No. 27. Storm Drain/Siphon

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

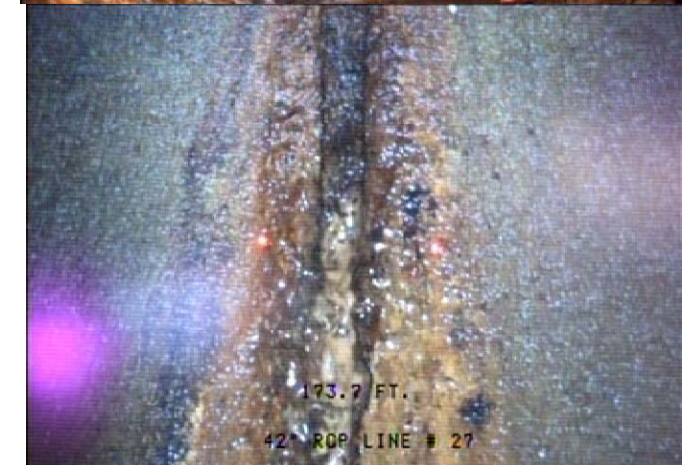
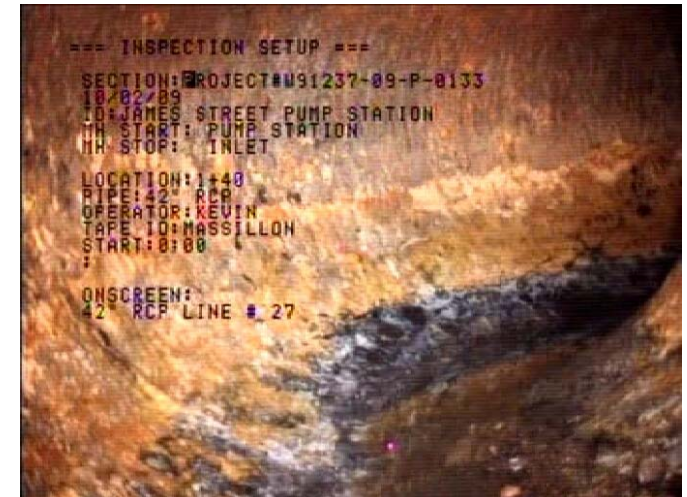
PIPE NO: 27 PIPE SIZE: 42" LENGTH INSPECTED: Approximately 376 ft
PROJECT: Massillon Levee TYPE: DIP/RCP/DIP INSPECTION DATE: 10/2/09

OVERALL CONDITION: **NASSCO Grade 5 – Defects required immediate attention**

GENERAL INSPECTION FINDING: DIP moderately corroded, several stained and leaking joints in RCP pipe.
Heavy flow from joint at 173 feet. Radial and diagonal cracking noted in several areas along upstream side of the structure.

MAJOR DEFECTS

Pipe # 27	
Feet	Defect
Start	DIP Pipe, moderately corroded
2ft-123ft	DIP
123ft	DIP to RCP
127ft	Weeping joint
141ft	Diagonal/Radial Cracking
155ft	Radial Cracking
169ft	Offset Joint
173ft	Leaking Joint/Gushing/flowing
175ft	Radial Cracking
177ft	Staining at joint
193ft	Diagonal/Radial Cracking
200ft	Staining/moisture at joint
251ft	Staining/moisture at joint
262ft	Diagonal cracking at joint
266ft	RCP to DIP
376ft	Gatewell



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

NASSCO PACP Condition Grading System Code Matrix

Family	Group	Descriptor	Modifier	Code	Structural Grade	O&M Grade
		Other (Z)		DNZ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
O&M	Roots (R)	Fine (F)	Barrel (B)	RFB		2
			Lateral (L)	RFL		1
			Connection (C)	RFC		1
	Roots (R) at a Joint		N/A	RF		1
		Tap (T)	Barrel (B)	RTB		3
			Lateral (L)	RTL		2
			Connection (C)	RTC		2
	Roots (R) at a Joint		N/A	RT		2
		Medium (M)	Barrel (B)	RMB		4
			Lateral (L)	RML		3
			Connection (C)	RMC		3
	Roots (R) at a Joint		N/A	RM		3
		Ball (B)	Barrel (B)	RBB		5
			Lateral (L)	RBL		4
			Connection (C)	RBC		4
	Roots (R) at a Joint		N/A	RB		4
O&M	Infiltration (I)	Weeper (W)		IW		2
		Dripper (D)		ID		3
		Runner (R)		IR		4
		Gusher (G)		IG		5
O&M	Obstacles/Obstructions (OB)	Brick or Masonry (B)		OBB		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Pipe Material in Invert (M)		OBM		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Protruding Thru Wall (I)		OBI		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Wedged in Joint (J)		OBJ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Thru Connection (C)		OBC		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5

Pipe No. 28

James Avenue Pump Station

48-inch RCP Gravity Outlet



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

James Avenue Pump Station

Pump station

Pump Stat. outlet

Pipe #26 outlet

Pipe # 26 inlet

Pipe #27

Pipe #28



HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: 28 PIPE SIZE: 48"
PROJECT: Massillon Levee TYPE: RCP INSPECTION DATE: 9/17/09

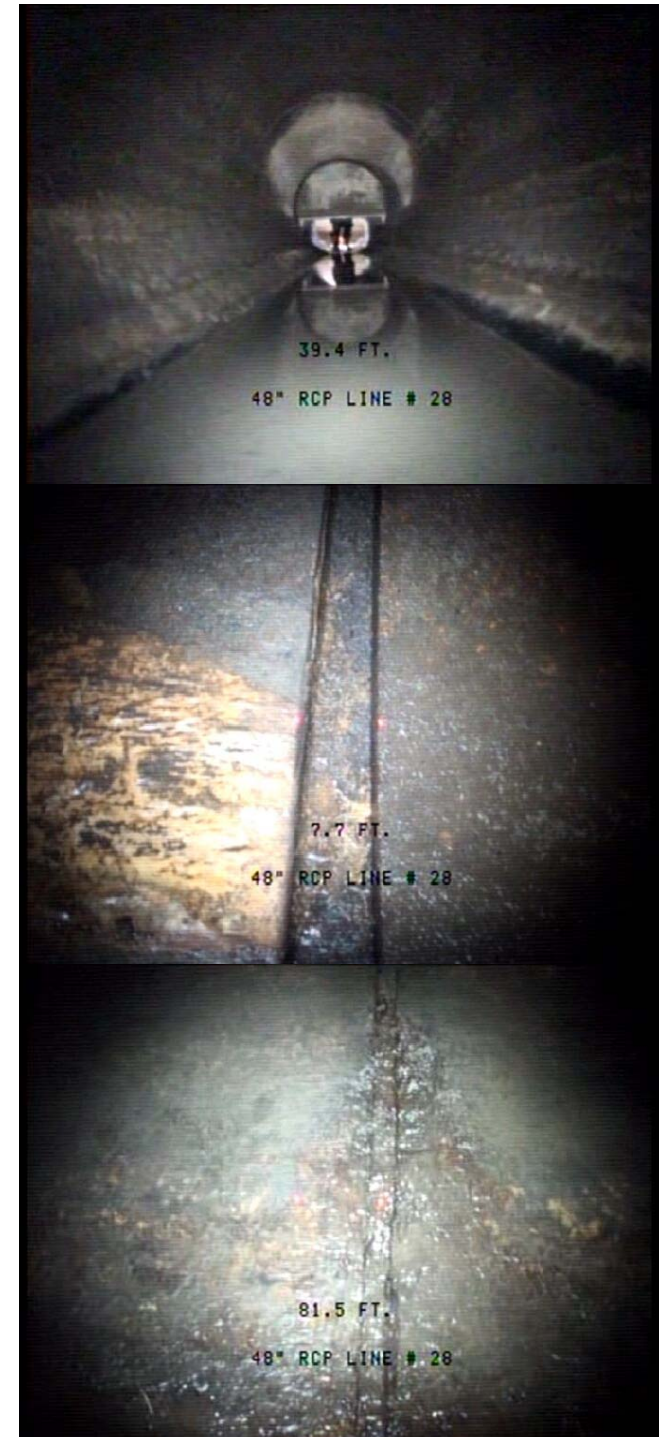
OVERALL CONDITION: **NASSCO Grade 4 – Severe defects that will become Grade 5 in near future**

GENERAL INSPECTION FINDING: Sagging was visible from inlet to gatewell. Joints more open on the bottom. Several joints were weeping water.

MAJOR DEFECTS

Pipe # 28	
Feet	Defect
7.7ft	Pipe sagging, approx. 2"+ joint separation at 4 o'clock
23.5ft	Pipe sagging, approx. 1 1/2" joint separation right haunch
39.4ft	Pipe sagging, 1.3" joint separation at approx. 3 o'clock
70ft	Weeping joint at approx. 9 o'clock, near gatewell
76.6ft	Gatewell
81.5ft	Weeping joint at approx. 3 o'clock
86.6ft	Weeping joint at approx. 3 o'clock
91.2ft	Weeping joint
96.1ft	Inlet tight

*Inspected inlet to out



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

NASSCO PACP Condition Grading System Code Matrix

Family	Group	Descriptor	Modifier	Code	Structural Grade	O&M Grade
		Other (Z)		DNZ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
O&M	Roots (R)	Fine (F)	Barrel (B)	RFB		2
			Lateral (L)	RFL		1
			Connection (C)	RFC		1
	Roots (R) at a Joint		N/A	RF		1
		Tap (T)	Barrel (B)	RTB		3
			Lateral (L)	RTL		2
			Connection (C)	RTC		2
	Roots (R) at a Joint		N/A	RT		2
		Medium (M)	Barrel (B)	RMB		4
			Lateral (L)	RML		3
			Connection (C)	RMC		3
	Roots (R) at a Joint		N/A	RM		3
		Ball (B)	Barrel (B)	RBB		5
			Lateral (L)	RBL		4
			Connection (C)	RBC		4
	Roots (R) at a Joint		N/A	RB		4
O&M	Infiltration (I)	Weeper (W)		IW		2
		Dripper (D)		ID		3
		Runner (R)		IR		4
		Gusher (G)		IG		5
O&M	Obstacles/Obstructions (OB)	Brick or Masonry (B)		OBB		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Pipe Material in Invert (M)		OBM		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Protruding Thru Wall (I)		OBI		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Wedged in Joint (J)		OBJ		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5
		Object Thru Connection (C)		OBC		<=10% - 2, <=20% - 3, <=30% - 4, >30% - 5

Pipe No. 29, 30, 31

30-Inch DIP Discharge Pipes



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: James Avenue, Pump Pipes (29, 30, 31) PIPE SIZE: 30" LENGTH INSPECTED: 100 ft.

PROJECT: Massillon Levee TYPE: Coated DIP INSPECTION DATE: 9/17/09

OVERALL CONDITION: NASSCO Grade 4: Pipe will probably fail in 5 to 10 years. Pipe rated at a more serious condition due to that it is a pump line going through a levee.

GENERAL INSPECTION FINDING: GENERAL INSPECTION FINDINGS: All three pipes have moderate to severe corrosion at the joints. Bellies have formed in the flat areas of the pipe at the beginning and the end of the runs toward the pump station. Missing protective coating and corrosion was also noted in flat areas and sharp bends. It appears in some sections that point repairs have been made on the protective coating. Recommend air pressure testing to verify integrity of the joints.

*Note: Pipe #29 has severe loss of lining from air-release valve to pump station on the downward grade

MAJOR DEFECTS

Feet	Defect
0-100 ft	All three pipes have moderate to severe corrosion at the joints. Bellies have formed in the flat areas of the pipe at the beginning and the end of the runs toward the pump station. Missing protective coating and corrosion was also noted in flat areas and sharp bends. It appears in some sections that point repairs have been made on the protective coating. Recommend air pressure testing to verify integrity of the joints.



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Federal Avenue 60-Inch RCP
Gravity Outlet
Pipe #32 (South Pipe)



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River



Federal Avenue Pump Station

This is an aerial photograph showing a large body of water, likely a reservoir or pond, situated between a residential area on the left and a multi-lane highway on the right. The residential area includes several houses and a large, light-colored building. The highway has multiple lanes with visible traffic. The water body is dark green and occupies the central portion of the image. Two red arrows point to specific features: one points to a small structure in the water labeled 'outlet', and the other points to a circular structure on the grassy bank labeled 'Pump station/Storm Drains'.

Pump station/Storm Drains

outlet

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: 32 PIPE SIZE: 60"
PROJECT: Massillon Levee TYPE: CMP to RCP INSPECTION DATE: 10/1/09

OVERALL CONDITION: NASSCO Grade 3 – Moderate defects that will continue to deteriorate

GENERAL INSPECTION FINDING: 0 to 42 feet CMP, CMP bituminous coating missing in haunches, moderately corroded. RCP 42 ft to gatewell appears to be in good condition. Moisture present at some of the joints.

MAJOR DEFECTS

Pipe # 32, Federal Avenue South Gravity	
Feet	Defect
2.0	Bituminous coating missing in haunch, moderately corroded
16.5	Bituminous coating missing in haunch, moderately corroded
19.7	Moisture at joint, 4 O'clock
22.0	Moisture at joint, 1.75" joint separation
42ft	Offset joint where CMP meets concrete, approx. 3" right side. Severely separated joint at crown.
53ft	Wet joint at approx. 3 o'clock
67ft	Staining at joint in crown
68ft	Rock in invert, could not move
79ft	Wet joint at approx. 3 o'clock
92ft	Staining at joint in crown
111ft	Wet joint at 9 o'clock
127ft	Approx. 1" joint separation, staining at 1:00
135ft	Gatewell



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)		A There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

NASSCO PACP Condition Grading System Code Matrix

Family	Group	Descriptor	Modifier	Code	Structural Grade	O&M Grade
		Missing Wall (MW)	C	SMWC	5	
		Other (Z)	C	SZC		
	Surface Damage Mechanical (M)	Roughness Increased (RI)	M	SRIM	1	
		Surface Spalling (SS)	M	SSSM	2	
		Aggregate Visible (AV)	M	SAVM	3	
		Aggregate Projecting (AP)	M	SAPM	3	
		Aggregate Missing (AM)	M	SAMM	4	
		Reinforcement Visible (RV)	M	SRVM	5	
		Reinforcement Corroded (RC)	M	SRCM	5	
		Missing Wall (MW)	M	SMWM	5	
		Other (Z)	M	SZM	N/A	
	Surface Damage Not Evident (Z)	Roughness Increased (RI)	Z	SRIZ	1	
		Surface Spalling (SS)	Z	SSSZ	2	
		Aggregate Visible (AV)	Z	SAVZ	3	
		Aggregate Projecting (AP)	Z	SAPZ	3	
		Aggregate Missing (AM)	Z	SAMZ	4	
		Reinforcement Visible (RV)	Z	SRVZ	5	
		Reinforcement Corroded (RC)	Z	SRCZ	5	
		Missing Wall (MW)	Z	SMWZ	5	
		Other (Z)	Z	SZZ	N/A	
	Surface Damage (Metal Pipes)	Corrosion (CP)		SCP	3	
Structural	Lining Failure (LF)	Detached (D)		LFD	3	
		Defective End (DE)		LFDE	3	
		Blistered (B)		LFB	3	
		Service Cut Shifted (CS)		LFCS	3	
		Abandoned Connection (AC)		LFAC		
		Overcut Service (OC)		LFOC	3	
		Undercut Service (UC)		LFUC	3	
		Buckled (BK)		LFBK	3	
		Wrinkled (W)		LFW	3	
		Other (Z)		LFZ		
Structural	Weld Failure (WF)	Circumferential (C)		WFC	2	
		Longitudinal (L)		WFL	2	
		Multiple (M)		WFM	3	
		Spiral (S)		WFS	2	
Structural	Point Repair (RP)	Localized Lining (L)		RPL		
		Localized Lining (L)	Defective (D)	RPLD	4	
		Patch Repair (P)		RPP		

Massillon, Ohio
Federal Avenue 60-Inch RCP
Gravity Outlet
Pipe #33 (North Pipe)



HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: 33 PIPE SIZE: 60"
PROJECT: Massillon Levee TYPE: CMP to RCP INSPECTION DATE: 10/1/09

OVERALL CONDITION: NASSCO Grade 3 – Moderate defects that will continue to deteriorate

GENERAL INSPECTION FINDING: 0 to 42 feet CMP, CMP bituminous coating missing in haunches, moderately corroded. RCP 42 ft to gatewell appears to be in good condition. Moisture present at some of the joints.

MAJOR DEFECTS

Pipe # 33, Federal Avenue North Gravity	
Feet	Defect
2.0ft	Bituminous coating missing along haunch
23ft	Offset joint, moisture and corrosion at joint, moderate corrosion left haunch
23ft	Rust coming from joint at 4 o'clock
39.4ft	Offset joint CMP to RCP
128ft	Joint separation 1-inch
134.4ft	Joint separation 2.2-inches
135.0ft	Gatewell



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)		A There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

NASSCO PACP Condition Grading System Code Matrix

Family	Group	Descriptor	Modifier	Code	Structural Grade	O&M Grade
		Missing Wall (MW)	C	SMWC	5	
		Other (Z)	C	SZC		
	Surface Damage Mechanical (M)	Roughness Increased (RI)	M	SRIM	1	
		Surface Spalling (SS)	M	SSSM	2	
		Aggregate Visible (AV)	M	SAVM	3	
		Aggregate Projecting (AP)	M	SAPM	3	
		Aggregate Missing (AM)	M	SAMM	4	
		Reinforcement Visible (RV)	M	SRVM	5	
		Reinforcement Corroded (RC)	M	SRCM	5	
		Missing Wall (MW)	M	SMWM	5	
		Other (Z)	M	SZM	N/A	
	Surface Damage Not Evident (Z)	Roughness Increased (RI)	Z	SRIZ	1	
		Surface Spalling (SS)	Z	SSSZ	2	
		Aggregate Visible (AV)	Z	SAVZ	3	
		Aggregate Projecting (AP)	Z	SAPZ	3	
		Aggregate Missing (AM)	Z	SAMZ	4	
		Reinforcement Visible (RV)	Z	SRVZ	5	
		Reinforcement Corroded (RC)	Z	SRCZ	5	
		Missing Wall (MW)	Z	SMWZ	5	
		Other (Z)	Z	SZZ	N/A	
	Surface Damage (Metal Pipes)	Corrosion (CP)		SCP	3	
Structural	Lining Failure (LF)	Detached (D)		LFD	3	
		Defective End (DE)		LFDE	3	
		Blistered (B)		LFB	3	
		Service Cut Shifted (CS)		LFCS	3	
		Abandoned Connection (AC)		LFAC		
		Overcut Service (OC)		LFOC	3	
		Undercut Service (UC)		LFUC	3	
		Buckled (BK)		LFBK	3	
		Wrinkled (W)		LFW	3	
		Other (Z)		LFZ		
Structural	Weld Failure (WF)	Circumferential (C)		WFC	2	
		Longitudinal (L)		WFL	2	
		Multiple (M)		WFM	3	
		Spiral (S)		WFS	2	
Structural	Point Repair (RP)	Localized Lining (L)		RPL		
		Localized Lining (L)	Defective (D)	RPLD	4	
		Patch Repair (P)		RPP		

Massillon, Ohio

Federal Avenue Pump Station

Pipe #34, 35, and 36



Pipes Inspected, Massillon Levee				
Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: Federal Avenue, Pump Pipes (34, 35, 36) PIPE SIZE: 30" LENGTH INSPECTED: 141 ft.

PROJECT: Massillon Levee TYPE: Coated DIP INSPECTION DATE: 9/15/09

OVERALL CONDITION: NASSCO Grade 4: Pipe will probably fail in 5 to 10 years. Pipe rated at a more serious condition due to that it is a pump line going through a levee.

GENERAL INSPECTION FINDINGS: All three pipes have moderate to severe corrosion at the joints. Missing protective coating and corrosion was also noted in flat areas and sharp bends. It appears in some sections that point repairs have been made on the protective coating. Recommend air pressure testing to verify integrity of the joints.

*Note: Pipe #35 has severe loss of lining from air-release valve to pump station on the downward grade section of pipe.

MAJOR DEFECTS

Feet	Defect
0-141 ft	All three pipes have moderate to severe corrosion at the joints. Missing protective coating and corrosion was also noted in flat areas and sharp bends. It appears in some sections that point repairs have been made on the protective coating. Recommend air pressure testing to verify integrity of the joints. *Note: Pipe #35 has severe loss of lining from air-release valve to pump station on the downward grade section of pipe.



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Sippo Creek 15'x10' RCB
Pipe #37



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

Sippo Avenue Pump Station

Outlet box

Pump station

Inlet



HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: Sippo Avenue Box #37 PIPE SIZE: 15' X 10' LENGTH INSPECTED: 202 ft.
PROJECT: Massillon Levee TYPE: RCP INSPECTION DATE: 11/12/09

OVERALL CONDITION: NASSCO Rating 3: Moderate defects that will continue to deteriorate.

GENERAL INSPECTION FINDINGS: Most of the joints appear to have some weeping and/or signs of staining at the joints. Invert is rough in areas indicating moderate scouring. Rebar exposed and some spalling noticed in areas.

MAJOR DEFECTS

Sippo Avenue 15' X 10' Box #37	
Feet	Defect
28ft	Spalling at joint
30ft	Reinforcing steel exposed in crown
39ft	Reinforcing steel exposed in crown
56ft	Weeping and stained joint. Rebar exposed from deteriorating joint.
76ft	Rebar exposed from deteriorating joint.
83ft	Weeping and stained joint. Rebar exposed from deteriorating joint.
98ft	Significant weeping and stained joint
110ft	Weeping and stained joint. Rebar exposed from deteriorating joint.
118ft	4" scour hole left haunch
Outlet-Pump Pipes	Invert under water, rough in areas, indicating moderate scour in the invert.



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. <u>A limited number of joints may have opened and soil loss may be beginning.</u> Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio

Sippo Creek 24" DIP Pump Pipes

Pipe #38, 39, 40



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

Sippo Creek Pump Station

Pump Station Discharge Pipes

Outlet Structure

Pump Station

Pump Station Inlet



HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: Sippo Avenue, Pump Pipes (38, 39, 40) PIPE SIZE: 24" LENGTH INSPECTED: 5, 10, 20
PROJECT: Massillon Levee TYPE: Coated DIP INSPECTION DATE: 9/17/09

OVERALL CONDITION: NASSCO Grade 4: Pipe will properly fail in 5 to 10 years. Pipe rated at a more serious condition due to that it is a pump line going through a levee.

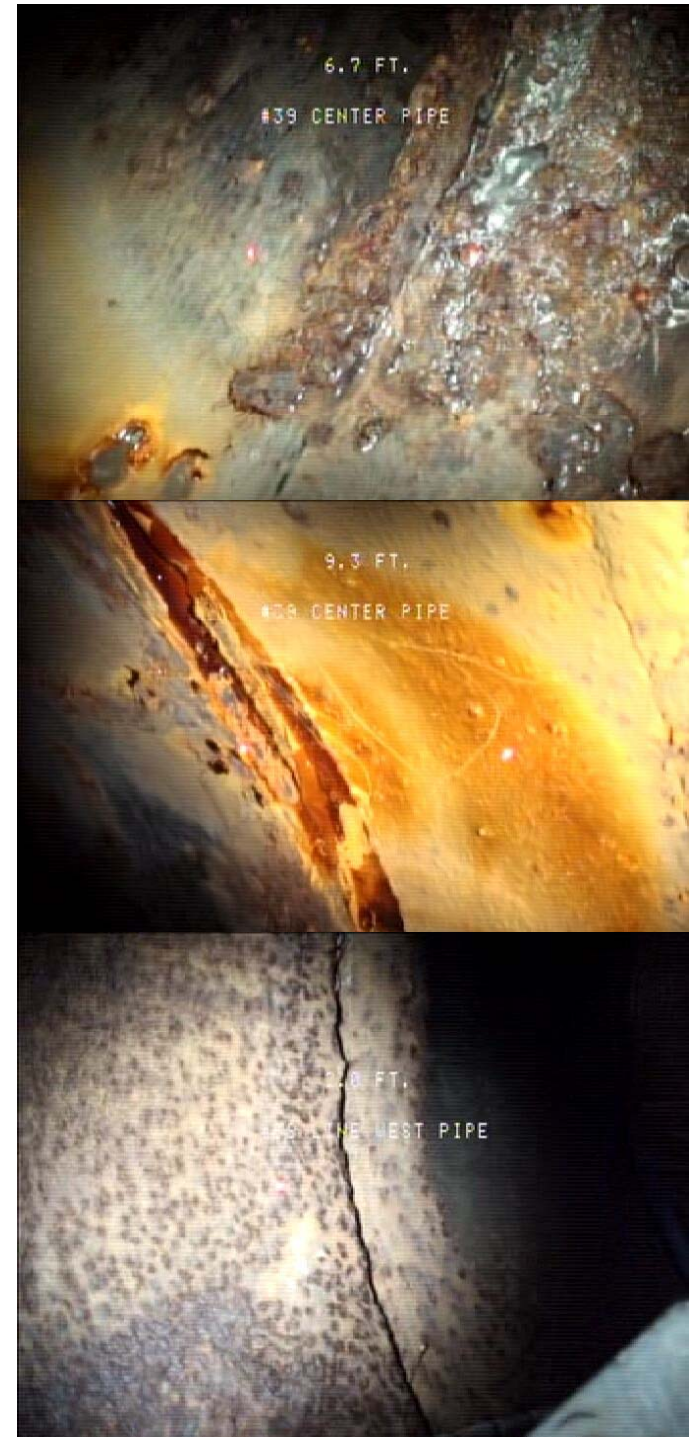
GENERAL INSPECTION FINDINGS: All three pipes have moderate to severe corrosion and rust at the joints and pipe walls. Missing protective coating was predominately around the haunches and inverts of the pipe. Recommend air pressure testing to verify integrity of the joints.

*Note: Pipe #39 (center) at 9.3ft has a severe offset/separated joint with potential leakage.

*Note: Punch list read total line footage at 120' per line. Actual footage: #38) approximately 5ft, #39) approximately 10ft, #40) approximately 20ft.

MAJOR DEFECTS

Feet	Defect
5, 10, 20 ft	All three pipes have moderate to severe corrosion and rust at the joints and pipe walls. Missing protective coating was predominately around the haunches and inverts of the pipe. Recommend air pressure testing to verify integrity of the joints. *Note: Pipe #39 (center) at 9.3ft has a severe offset/separated joint with potential leakage.



Levee Embankments

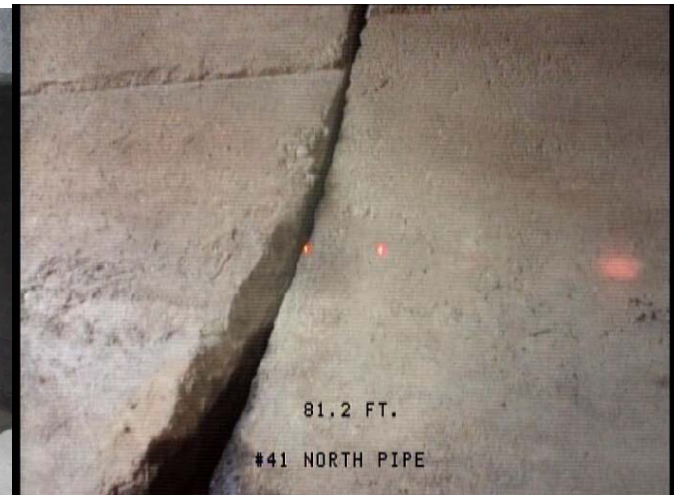
For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Arch Avenue 6'x6' RCB
Pipe #41 (North Box)



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

Arch Avenue Pump Station

Pump Station

Discharge Well and Outlet

Gravity Conduit Outlet

© 2009 Tele Atlas

Image © 2009 DigitalGlobe

40°46'58.58"N 81°31'07.68"W elev. 282 m

©2009 Google

Imagery Dates: Apr 18, 2006 - Apr 19, 2006

Eye alt 734 m

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: Arch Avenue Box #41 PIPE SIZE: 6' X 6' LENGTH INSPECTED: 8/ ft.

PROJECT: Massillon Levee TYPE: RCP INSPECTION DATE: 11/12/09

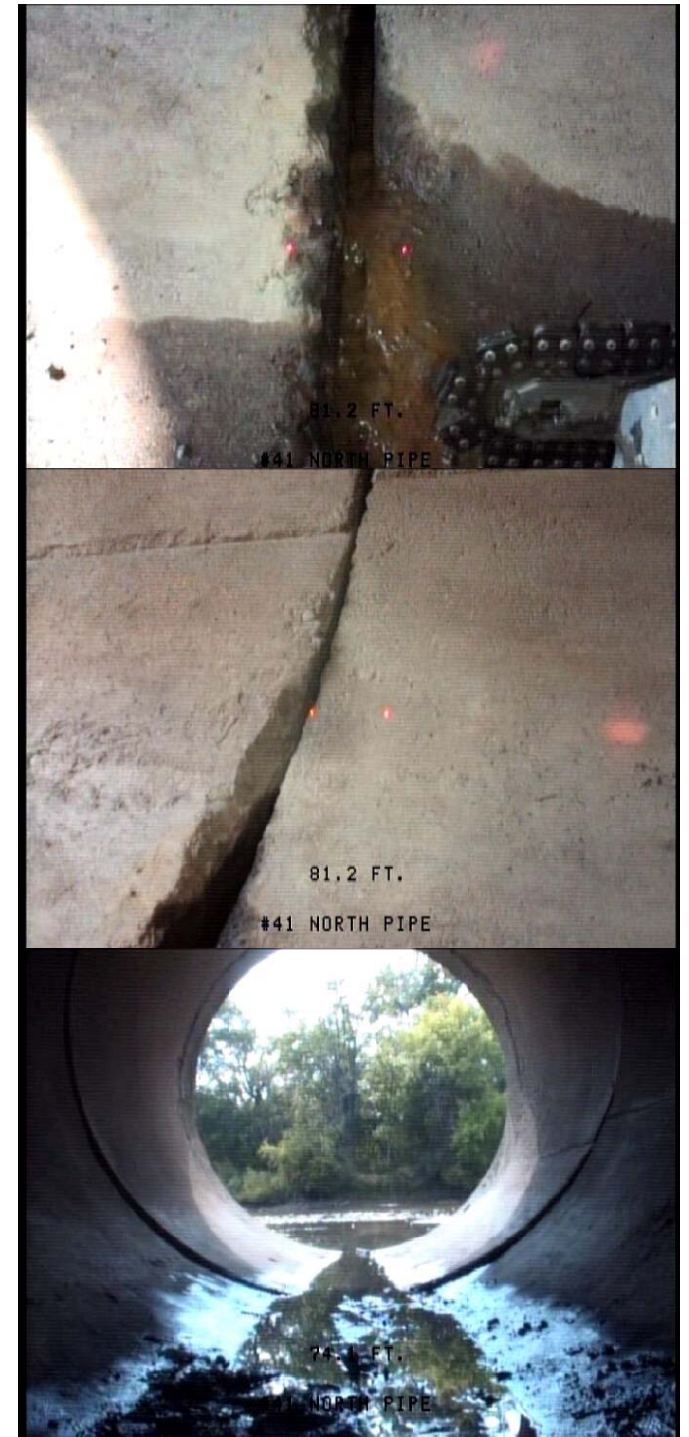
OVERALL CONDITION: NASSCO Rating 3: Moderate defects that will continue to deteriorate.

GENERAL INSPECTION FINDINGS: Some of the joints are starting to become offset, possible soil movement is starting to occur in some areas.

MAJOR DEFECTS

Arch Avenue Box #41	
Feet	Defect
5 ft	Rebar/nails visible in crown
23ft	Slight spalling/ offset joint in crown
32ft	Hairline cracking
46ft	Open joint between North and South barrel
68ft	Scouring/Staining in crown
80ft	Right haunch, offset joint approx. 2", possible soil penetration
85ft	Spalling/ cracking at headwall

*First part of the structure from the inlet to gatewell is RCB, gatewell to outlet is RCP



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. <u>A limited number of joints may have opened and soil loss may be beginning.</u> Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio Arch Avenue 6'x6'RCB Pipe #42 (South Box)



HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: Arch Avenue Box #42 PIPE SIZE: 6' X 6' LENGTH INSPECTED: 8/ ft.

PROJECT: Massillon Levee TYPE: RCP INSPECTION DATE: 11/12/09

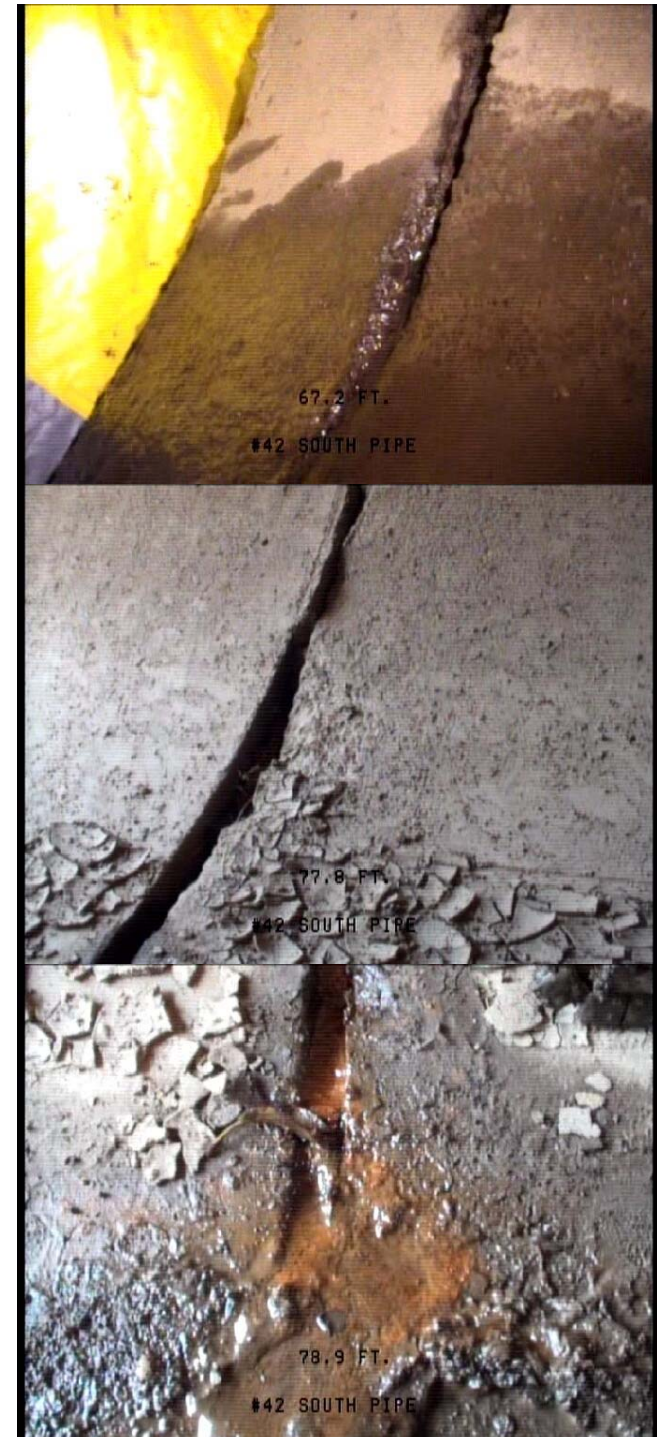
OVERALL CONDITION: NASSCO Rating 3: Moderate defects that will continue to deteriorate.

GENERAL INSPECTION FINDINGS: GENERAL INSPECTION FINDINGS: Some of the joints are starting to become offset, possible soil movement is starting to occur in some areas.

MAJOR DEFECTS

Arch Avenue Box #42	
Feet	Defect
0ft-2ft	Spalling, staining, and moisture at joint
13ft	Nails/Rebar in crown
18ft	Spalling at joint right side
23ft	10- inch penetration right side
46ft	Open joint between barrels/ 8- inch penetration in crown/ 6- inch penetration left side/ erosion of joint at invert
52ft	Moisture in joint
68ft-70ft	Spalling/staining of joint, deterioration and scouring at haunch
79ft	Scouring at joint in left haunch, missing mortar in joint, as well as soil/rust penetrating through joint
84ft	Radial cracking near joint/ cracking at joint and exposed rebar at 11 o'clock

*First part of the structure from the inlet to gatewell is RCB, gatewell to outlet is RCP



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. <u>A limited number of joints may have opened and soil loss may be beginning.</u> Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Arch Avenue 24" CIP Pump Pipes
Pipe #43 (South), 44 (Center), 45 (North)



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCP	120	Sippo Avenue Pump Station
38	24	CIP	5	Discharge from Sippo Avenue Pump Station
39	24	CIP	10	Discharge from Sippo Avenue Pump Station
40	24	CIP	20	Discharge from Sippo Avenue Pump Station
41	6'X6'	RCP	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCP	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

Arch Avenue Pump Station

Pump Station

Pump/box Outlet



HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

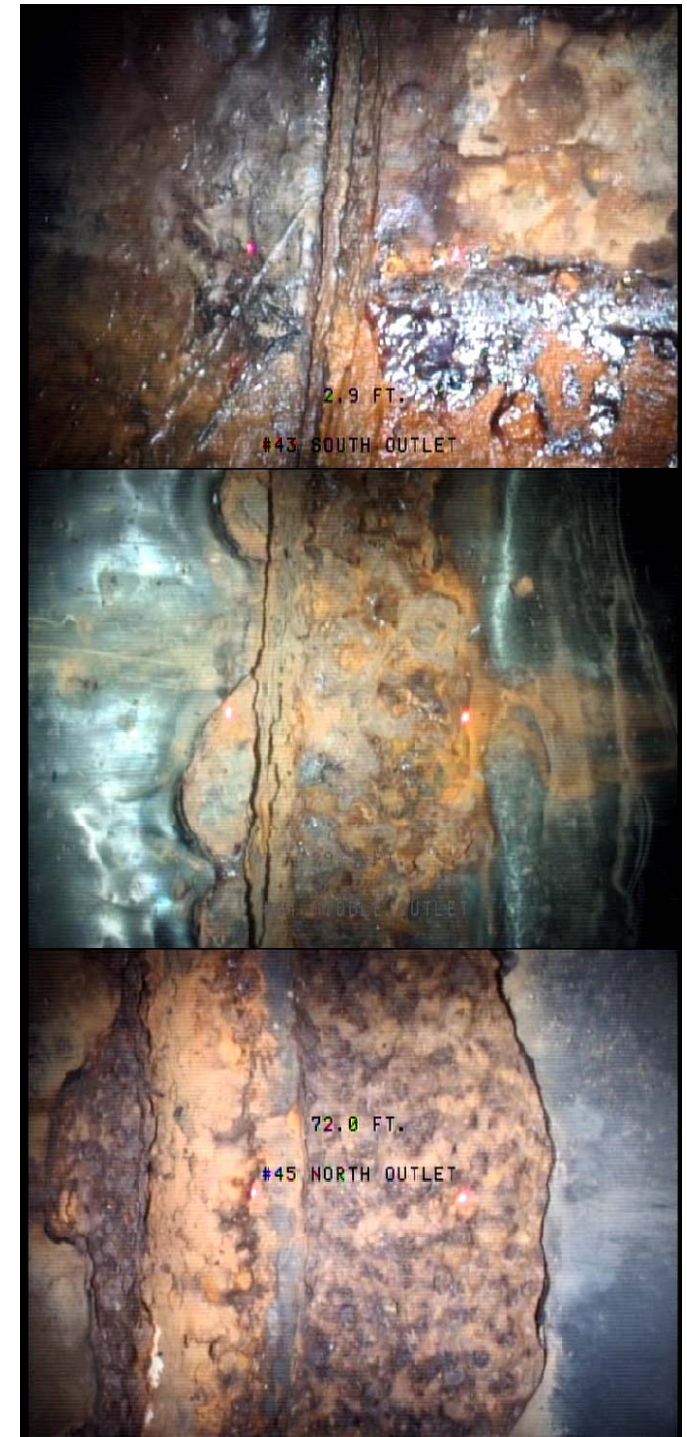
PIPE NO: Arch Avenue Pump Pipes (43, 44, 45) PIPE SIZE: 24" LENGTH INSPECTED: 85 ft.
PROJECT: Massillon Levee TYPE: CIP INSPECTION DATE: 9/14/09

OVERALL CONDITION: NASSCO Grade 4: Pipe will probably fail in 5 to 10 years. Pipe rated at a more serious condition due to that it is a pump line going through a levee.

GENERAL INSPECTION FINDINGS: All three pipes have moderate to severe corrosion at the joints. Missing protective coating and corrosion was also noted in flat areas and sharp bends. It appears in some sections that point repairs have been made on the protective coating. Recommend air pressure testing to verify integrity of the joints.

MAJOR DEFECTS

Feet	Defect
0-85 ft	All three pipes have moderate to severe corrosion at the joints. Missing protective coating and corrosion was also noted in flat areas and sharp bends. It appears in some sections that point repairs have been made on the protective coating. Recommend air pressure testing to verify integrity of the joints.



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

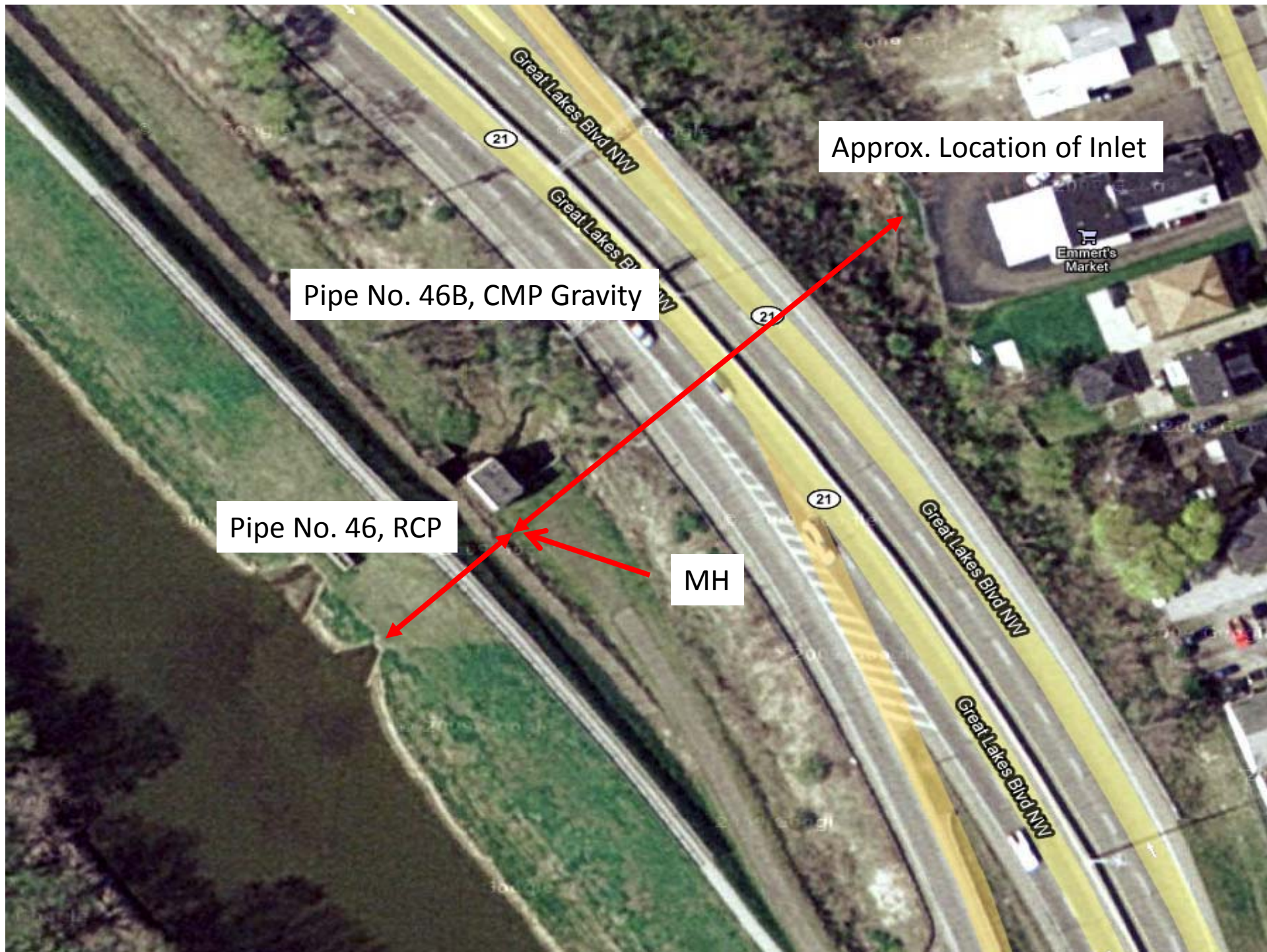
Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Arch Avenue Gravity-RCP
Pipe #46
(MH downgrade through levee)





Approx. Location of Inlet

Pipe No. 46B, CMP Gravity

Pipe No. 46, RCP

MH

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: Arch Avenue Pipe #46 PIPE SIZE: 48" LENGTH INSPECTED: 90 ft.

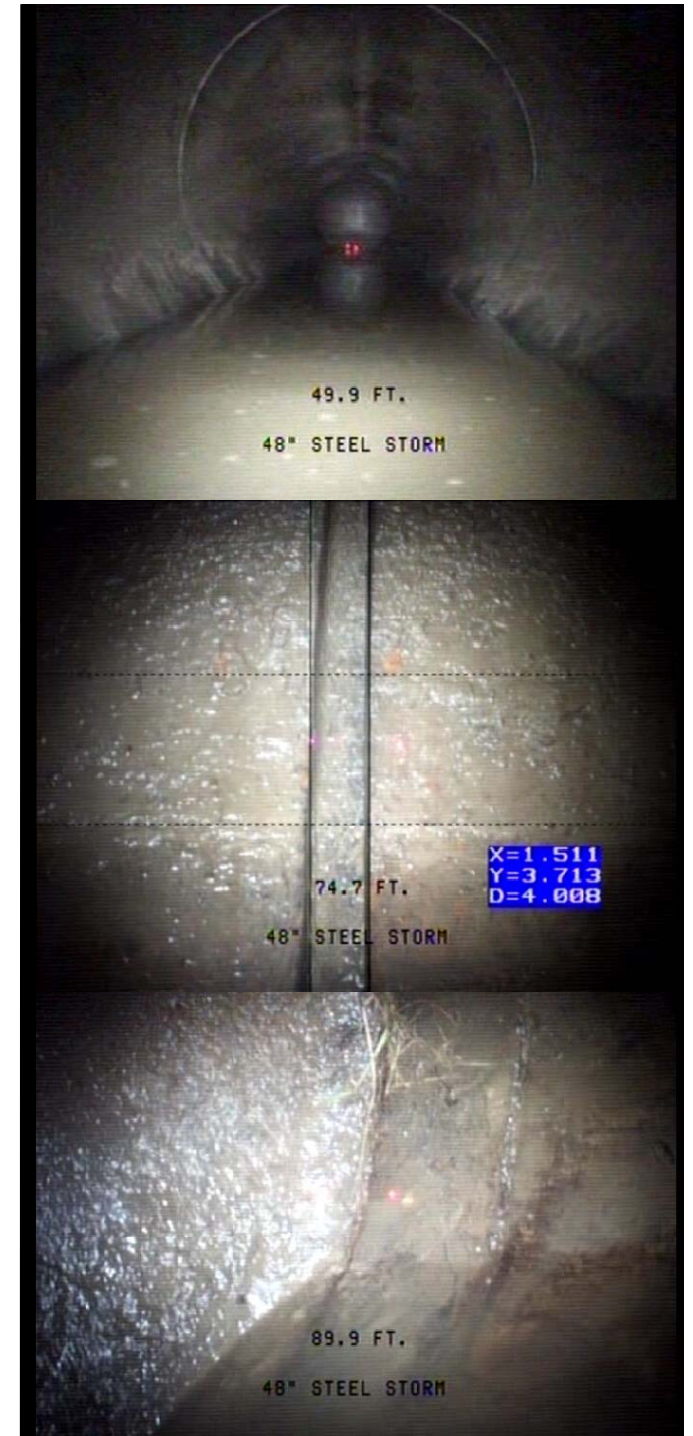
PROJECT: Massillon Levee TYPE: RCP INSPECTION DATE: 9/29/09

OVERALL CONDITION: NASSCO Rating 3: Moderate defects that will continue to deteriorate.

GENERAL INSPECTION FINDINGS: Some of the joints are wider at the bottom, indicating the pipe may have settled some.

MAJOR DEFECTS

Arch Avenue Pipe #46 (MH to Gatewell/Outlet)	
Feet	Defect
0ft-90ft	Several joints appear to be wider at the bottom, indicating that the line has some slight settlement.



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)		A There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Arch Avenue Gravity-CMP
Pipe #46b
(From MH going upstream under road)

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY
PIPES UNDER LEVEES

PIPE NO: Arch Avenue Pipe #46b PIPE SIZE: 48" LENGTH INSPECTED: 317 ft.

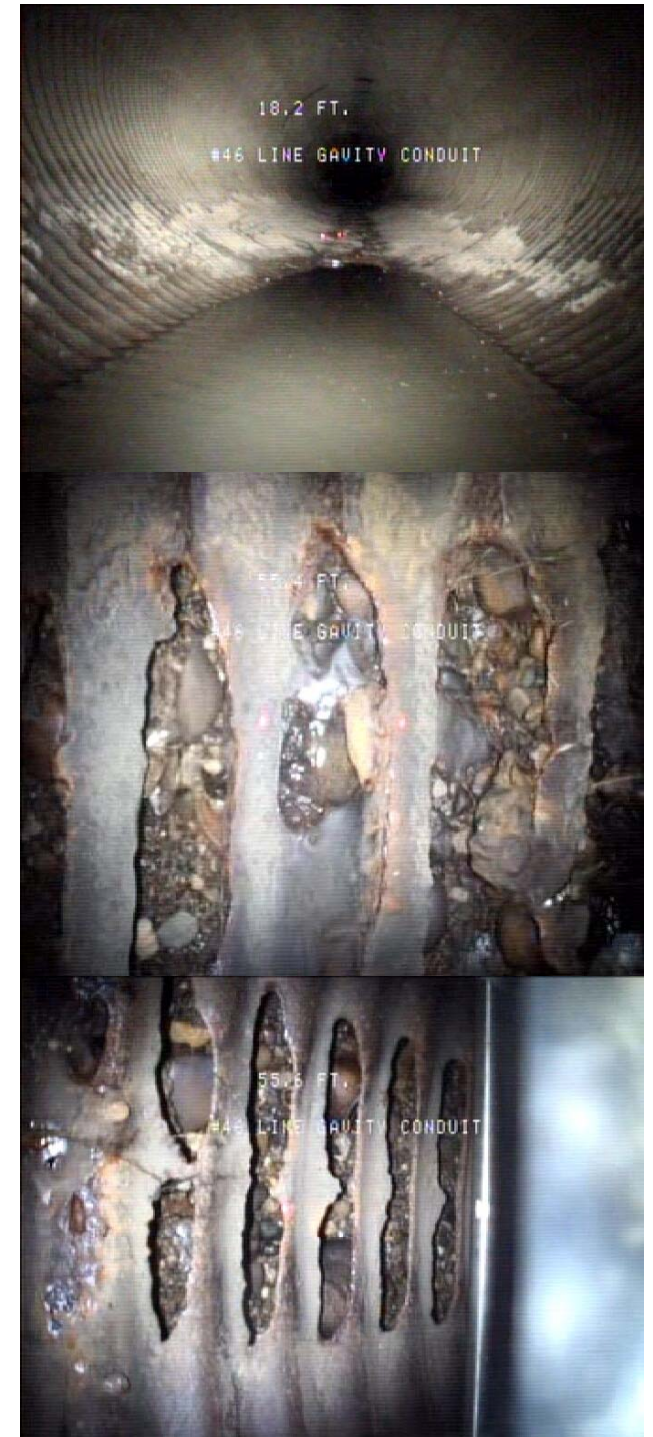
PROJECT: Massillon Levee TYPE: CMP INSPECTION DATE: 11/10/09

OVERALL CONDITION: NASSCO Rating 5: Pipe is failing, requires immediate attention.

GENERAL INSPECTION FINDINGS: Invert is missing in several areas, starting to deflect in areas.

MAJOR DEFECTS

Arch Avenue Pipe #46B (MH Upgrade)	
Feet	Defect
0ft-317ft	Invert is rusted completely through in several areas throughout the pipe, starting to deflect and buckle in areas.



Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
8. Monolith Joints	A	The joint material is in good condition. The exterior joint sealant is intact and cracking/ desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	
	M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	
	U	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
	N/A	There are no monolith joints in the interior drainage system.	
9. Culverts/Discharge Pipes ¹	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Interior Drainage System



Massillon, Ohio
Brookfield and Wooster
Sanitary Sewer Siphons



Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

Massillon, Ohio
Brookfield Siphons
Pipe #47, 48, 49

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCP	120	Sippo Avenue Pump Station
38	24	CIP	5	Discharge from Sippo Avenue Pump Station
39	24	CIP	10	Discharge from Sippo Avenue Pump Station
40	24	CIP	20	Discharge from Sippo Avenue Pump Station
41	6'X6'	RCP	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCP	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Siphon-Conduit-Tuscarawas River



Brookfield Siphon outlet box

Massillon, Ohio
Brookfield Sanitary Sewer Siphon
Pipe #47, 24-inch DIP

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCP	120	Sippo Avenue Pump Station
38	24	CIP	5	Discharge from Sippo Avenue Pump Station
39	24	CIP	10	Discharge from Sippo Avenue Pump Station
40	24	CIP	20	Discharge from Sippo Avenue Pump Station
41	6'X6'	RCP	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCP	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY

PIPES UNDER LEVEES

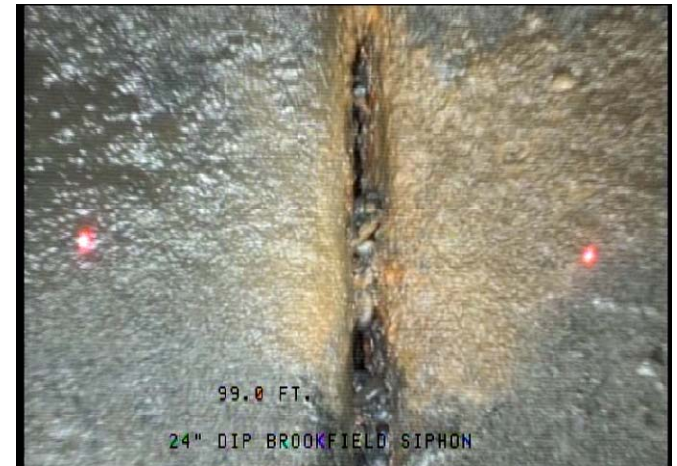
PIPE NO: Brookfield Siphon #47 PIPE SIZE: 24" LENGTH INSPECTED: 400ft
PROJECT: Massillon Levee TYPE: DIP INSPECTION DATE: 10/27/09

OVERALL CONDITION: NASSCO Grade 3: Moderate defects that will continue to deteriorate

GENERAL INSPECTION FINDING: Sheets of the liner coming off in several areas. Some corrosion noted in areas where coating was missing. No gate valves on inlet or outlet. Pipe slopes up on constant grade from inlet to outlet.

MAJOR DEFECTS

Brookfield Siphon 24"- Outlet	
Feet	Observation/Defect
10ft	Corroded joint at crown
28ft	Approx. 1" joint separation at 7 o'clock, Corroded joint in crown
45.6ft	Tear in lining at approx. 4o'clock
78.7ft	Lining peeling away from pipe walls at haunches
99ft	Rust coming from joint at crown
134.7ft	Rusting of joint at crown
146.8ft	Large piece of lining detached from pipe wall
170.5ft	Minor joint corrosion at crown
200.7ft	Lining peeling away from pipe wall along joint
241.7ft	Minor joint separation at approx. 4 o'clock
273.6ft	Lining peeling away from pipe walls at invert
277.1ft	Corrosion of joint/ small tear in lining
330.5ft	Minor joint separation >1/2"



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)		A There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Brookfield Sanitary Sewer Siphon
Pipe #48, 14-inch DIP

Pipes Inspected, Massillon Levee				
Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY

PIPES UNDER LEVEES

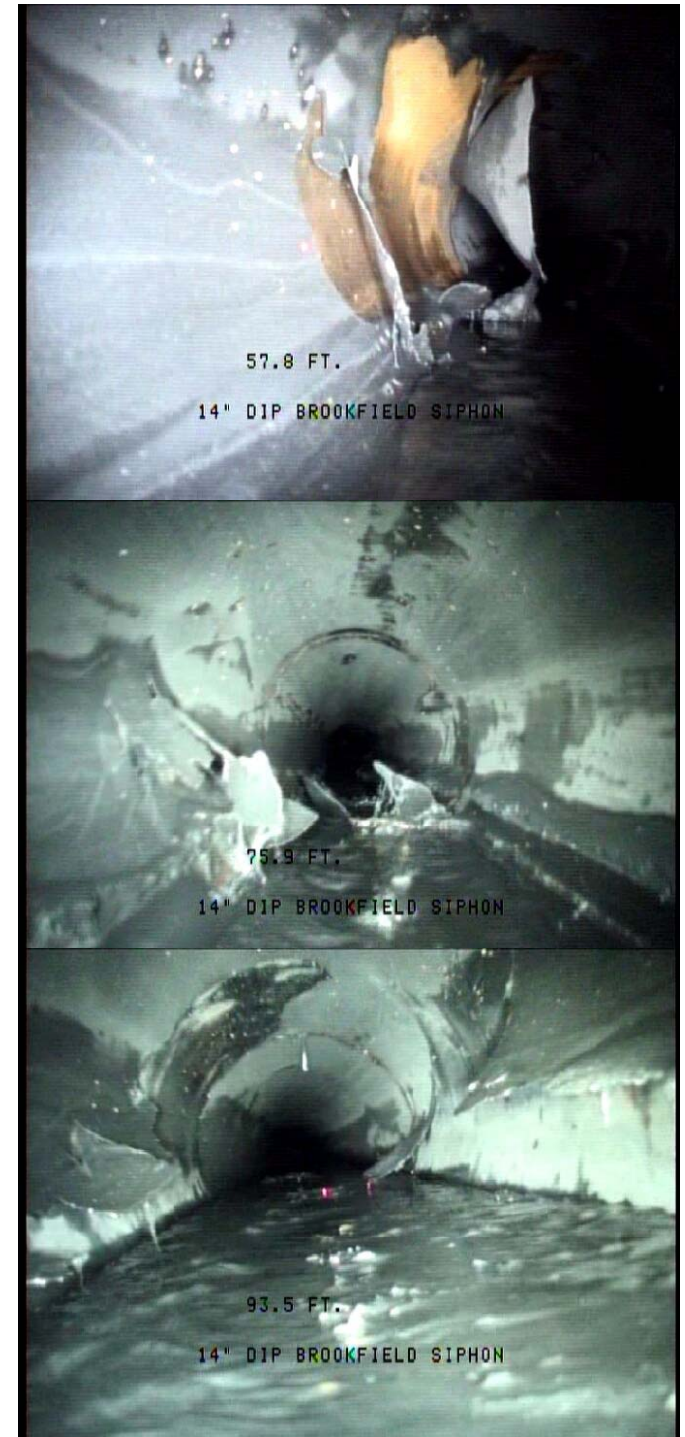
PIPE NO: Brookfield Siphon #48 PIPE SIZE: 14" LENGTH INSPECTED: 93ft
PROJECT: Massillon Levee TYPE: DIP INSPECTION DATE: 11/09/09

OVERALL CONDITION: NASSCO Grade 3: Moderate defects that will continue to deteriorate

GENERAL INSPECTION FINDING: Large sections of protective coating coming off in several areas.
No gate valves on inlet or outlet. Pipe slopes up on constant grade from inlet to outlet.

MAJOR DEFECTS

Brookfield Siphon 14" – Outlet	
Feet	Remarks/Defects
58ft	Large sections of protective coating coming off
75ft	Protective coating coming off
78ft	Protective coating coming off
93ft	Protective coating coming off
93ft	Debris level to high to continue, inspection discontinued.



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)		A There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Brookfield Sanitary Sewer Siphon
Pipe #49, 20-inch DIP

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY

PIPES UNDER LEVEES

PIPE NO: Brookfield Siphon #49 PIPE SIZE: 20" LENGTH INSPECTED: 216ft
PROJECT: Massillon Levee TYPE: DIP INSPECTION DATE: 11/09/09

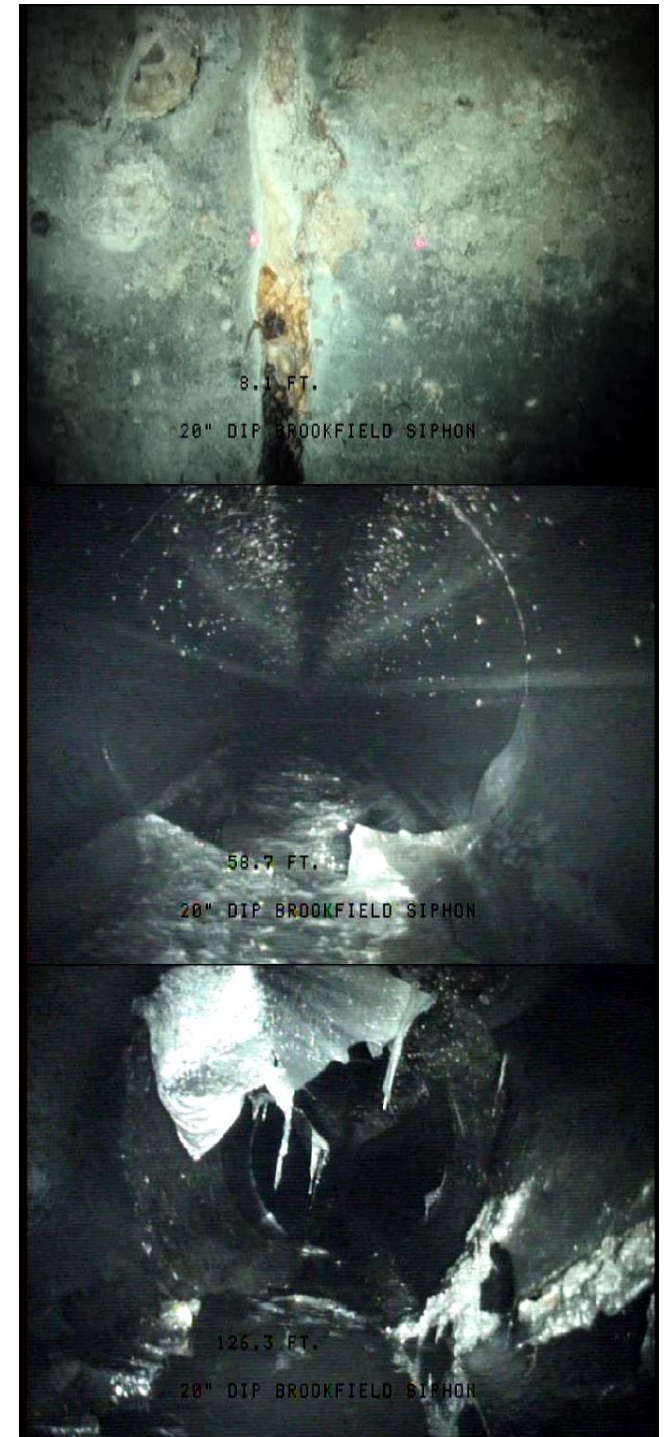
OVERALL CONDITION: NASSCO Grade 3: Moderate defects that will continue to deteriorate

GENERAL INSPECTION FINDING: Minor rust at joints, large sections of protective coating coming off in several areas. Not gate valves on inlet or outlet. Pipe slopes up on constant grade from inlet to outlet.

MAJOR DEFECTS

Brookfield Siphon 20" - Outlet	
Feet	Observation/Defect
8.1ft	Minor rusting of joint at crown
37.9ft	Lining missing from pipe walls
58.7ft	Lining peeling away from invert of pipe
94.9ft	Small piece of lining starting to peel away from right wall
126.3ft	Large section of damaged lining
165.3ft	Lining peeling from left haunch
216.9ft	Pipe becomes full of debris

*Inspected from outlet to inlet



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)		A There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Wooster Siphons
Pipe #50, 51, 52

Gate valve in pipe 51 and 52 were
frozen mid way, pipes could not be inspected.

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River



Brookfield siphon inlet

Wooster siphon inlet

Brookfield siphon outlet

Wooster siphon outlet

© 2009 Tele Atlas

Image © 2009 DigitalGlobe

40°47'54.12" N 81°31'45.08" W elev: 283 m

©2009 Google

Eye alt 648 m

Massillon, Ohio
Wooster Sanitary Sewer Siphons
Pipe #50, 18" DIP

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY

PIPES UNDER LEVEES

PIPE NO: Wooster Siphon #50 PIPE SIZE: 18" LENGTH INSPECTED: 108ft
PROJECT: Massillon Levee TYPE: DIP INSPECTION DATE: 11/11/09

OVERALL CONDITION: NASSCO Grade 4: Severe defects that will become grade 5 in the near future.

GENERAL INSPECTION FINDING: Pipe is severely corroded above the waterline. Gate valve severely corroded. Was very difficult to move.

MAJOR DEFECTS

Wooster Siphon 18" - Outlet	
Feet	Observation/Defect
2.0ft	Broken bell at crown
3.5ft	Severely corroded out gate valve
3.5ft-108ft	Pipe above water line is severely corroded
7.5ft	Joint separation 1.75-inches
20.0ft	Joint separation approximately 1.75-inches
108ft	Vertical offset at joint in crown viewable from 108 ft.
108ft	Inspection discontinued



Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee systems

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
11. Culverts/ Discharge Pipes ¹ (This item includes both concrete and corrugated metal pipes.)	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
	U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
	N/A	There are no discharge pipes/ culverts.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

Massillon, Ohio
Wooster Siphons
Pipe #51 and 52
10" and 15" DIP

Pipes could not be inspected due to the gate valves being froze mid way.

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY

PIPES UNDER LEVEES

PIPE NO: Wooster Siphon #51-52 PIPE SIZE: 10-15" LENGTH INSPECTED: 0ft
PROJECT: Massillon Levee TYPE: DIP INSPECTION DATE: 11/11/09
OVERALL CONDITION: NASSCO Grade 5: Gate valves frozen

GENERAL INSPECTION FINDING: Gate valves were frozen, pipe 50 showed signs of severe corrosion above water line.

MAJOR DEFECTS

Wooster Siphon Pipe No. 51 and 52	
Feet	Observation/Defect
0.0	Gate valves frozen, could not be moved



Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
17. Intake and Discharge Pipelines	A	Intake and discharge pipelines have no corrosion and paint is intact, except for minor touch up required. Pipe couplings and anchors have no leakage or corrosion.	
	M	Intake and discharge pipelines have minor corrosion and repair and painting is required. Pipe coupling with anchors have minor leakage, corrosion and require bolts to be tightened.	
	U	Intake and discharge pipelines have major corrosion and replacement is required. Pipe coupling with anchors have major leakage and is heavily corroded and requires replacement.	
18. Sluice/ Slide Gates ¹	A	Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.	
	M	Gates and/or operators have been damaged or have minor corrosion, and open and close with resistance or binding. Leakage quantity is controllable, but maintenance is required. Sill is free of sediment and other obstructions.	
	U	Gates do not open or close and/or operators do not function. Gate, stem, lifter and/or guides may be damaged or have major corrosion.	
	N/A	There are no sluice/ slide gates.	
19. Flap Gates/ Flap Valves/ Pinch Valves ²	A	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	
	M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
	U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
	N/A	There are no gates on discharge lines from pump station.	
20. Cranes ²	A	Cranes operational and have been inspected and load tested in accordance with applicable standards within the last year. Documentation is on hand.	
	M	Cranes have not been inspected or operationally tested within the past year, or there are visible signs of corrosion, oil leakage, etc, requiring maintenance.	
	U	Cranes are not operational, and this may prevent the pump station from functioning as required. No documentation available on cranes.	
	N/A	There are no cranes.	
21. Other Metallic Items (Equipment, Ladders, Platform, Anchors, etc)	A	All metal parts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.	
	M	Corrosion seen on metallic parts appears to be maintainable.	
	U	Metallic parts are severely corroded and require replacement to prevent failure, equipment damage, or safety issues.	
	N/A	There are no other significant metallic items.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ Proper operation of the gates (full open and closed) must be demonstrated during the inspection if no documentation is available. Be aware of both manual and electrical operators.

² Proper operation of this item must be demonstrated during the inspection.

Massillon, Ohio
Tuscarawas Sanitary Sewer Siphon
Pipe #53 and 54



Tuscarawas Siphon

inlet

outlet

© 2009 Tele Atlas

Image © 2009 DigitalGlobe

40°47'34.00" N 81°31'35.28" W elev. 282 m

Imagery Date: Apr 18, 2006

©2009

Google

Eye alt 643 m

Pipes Inspected, Massillon Levee

Pipes	Size (Inches)	Material	Length (Feet)	Location
23	18	RCP	103	West of RR with Flap Gate
24	12	RCP?	175	Could not locate/unknown/does not exist
25	42	RCP	95	Culvert through West Bank Levee opposite of Croose Avenue
26	66	RCP	93	Culvert through East Bank Levee near control weir
27	42	RCP	360	At inlet to siphon control weir
28	48	RCP	97	James Avenue Pump Station Gravity Outlet
29	30	CIP	100	Discharge from James Avenue Pump Station
30	30	CIP	100	Discharge from James Avenue Pump Station
31	30	CIP	100	Discharge from James Avenue Pump Station
32	60	RCP	135	Federal Avenue Pump Station Outlet
33	60	RCP	135	Federal Avenue Pump Station Outlet
34	30	CIP	141	Discharge from Federal Avenue Pump Station
35	30	CIP	141	Discharge from Federal Avenue Pump Station
36	30	CIP	141	Discharge from Federal Avenue Pump Station
37	15'X10'	RCB	120	Sippo Creek Pump Station
38	24	CIP	5	Discharge from Sippo Creek Pump Station
39	24	CIP	10	Discharge from Sippo Creek Pump Station
40	24	CIP	20	Discharge from Sippo Creek Pump Station
41	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
42	6'X6'	RCB	87	Gravity Arch Avenue Pump Station
43	24	CIP	85	Discharge from Arch Avenue Pump Station
44	24	CIP	85	Discharge from Arch Avenue Pump Station
45	24	CIP	85	Discharge from Arch Avenue Pump Station
46	48	RCP	90	Gravity Conduit through levee
46b	48	CMP	317	Gravity Conduit MH upstream of Levee
47	24	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
48	14	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
49	20	DIP	460	Sanitary Siphon-Conduit-Brookfield Interceptor
50	18	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk
51	10	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
52	15	DIP	460	Sanitary Siphon-Conduit-Wooster Trunk (Could not be inspected)
53	8	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River
54	10	VCP	450	Sanitary Siphon-Conduit-Tuscarawas River

Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines	Location/ Remarks/ Recommendations
17. Intake and Discharge Pipelines	A	Intake and discharge pipelines have no corrosion and paint is intact, except for minor touch up required. Pipe couplings and anchors have no leakage or corrosion.	
	M	Intake and discharge pipelines have minor corrosion and repair and painting is required. Pipe coupling with anchors have minor leakage, corrosion and require bolts to be tightened.	
	U	Intake and discharge pipelines have major corrosion and replacement is required. Pipe coupling with anchors have major leakage and is heavily corroded and requires replacement.	
18. Sluice/ Slide Gates ¹	A	Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.	
	M	Gates and/or operators have been damaged or have minor corrosion, and open and close with resistance or binding. Leakage quantity is controllable, but maintenance is required. Sill is free of sediment and other obstructions.	
	U	Gates do not open or close and/or operators do not function. Gate, stem, lifter and/or guides may be damaged or have major corrosion.	
	N/A	There are no sluice/ slide gates.	
19. Flap Gates/ Flap Valves/ Pinch Valves ²	A	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	
	M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
	U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
	N/A	There are no gates on discharge lines from pump station.	
20. Cranes ²	A	Cranes operational and have been inspected and load tested in accordance with applicable standards within the last year. Documentation is on hand.	
	M	Cranes have not been inspected or operationally tested within the past year, or there are visible signs of corrosion, oil leakage, etc, requiring maintenance.	
	U	Cranes are not operational, and this may prevent the pump station from functioning as required. No documentation available on cranes.	
	N/A	There are no cranes.	
21. Other Metallic Items (Equipment, Ladders, Platform, Anchors, etc)	A	All metal parts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.	
	M	Corrosion seen on metallic parts appears to be maintainable.	
	U	Metallic parts are severely corroded and require replacement to prevent failure, equipment damage, or safety issues.	
	N/A	There are no other significant metallic items.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

¹ Proper operation of the gates (full open and closed) must be demonstrated during the inspection if no documentation is available. Be aware of both manual and electrical operators.

² Proper operation of this item must be demonstrated during the inspection.

Massillon, Ohio
Tuscarawas Sanitary Sewer Siphon
Pipe #53, 8-inch VCP

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY

PIPES UNDER LEVEES

PIPE NO: Tuscarawas Siphon #53 PIPE SIZE: 8" LENGTH INSPECTED: 5ft
 PROJECT: Massillon Levee TYPE: VCP INSPECTION DATE: 11/11/09

OVERALL CONDITION: NASSCO Grade 4: Several defects that will become grade 5 in the near future.

GENERAL INSPECTION FINDING: Gate valves broken and no longer in service at outlet, diversion board rotten out in inlet, ladders severely corroded/missing, severe corrosion at outlet, heavy debris, questionable severe offset joint at outlet.

MAJOR DEFECTS

Siphon Pipe No. 54	
Feet	Observation/Defect
2.0	Severe corrosion at outlet



Massillon, Ohio
Tuscarawas Sanitary Sewer Siphon
Pipe #54, 10-inch VCP

HUNTINGTON DISTRICT
U.S. ARMY CORPS OF ENGINEERS
CONTRACT NO. W91237-09-P-0133
CCTV AND LASER PROFILE INSPECTION SUMMARY

PIPES UNDER LEVEES

PIPE NO: Tuscarawas Siphon #54 PIPE SIZE: 10" LENGTH INSPECTED: 33ft
PROJECT: Massillon Levee TYPE: VCP INSPECTION DATE: 11/11/09

OVERALL CONDITION: NASSCO Grade 4: Several defects that will become grade 5 in the near future.

GENERAL INSPECTION FINDING: Gate valves broken and no longer in service at outlet, diversion board rotten out in inlet, ladders severely corroded/missing, several offset joints, joint materials sealant missing.

MAJOR DEFECTS

Siphon Pipe No. 54	
Feet	Observation/Defect
2.0	Joint offset, possible crack in bell
13.6	Several offset joints visible down grade
15.0	Joint separation 0.91-inches
18.3	Joint separation 1.26-inches
18.3	Several offset joints visible down grade
19.7	Offset joint in invert
24.0	Pipe bends to the left/down river
32.0	Grade begins to flatten out
33.1	End inspection due to high water

