

CONFINED SPACE INSPECTION REPORT

SFN: 3102890	c44 General: 1	Bridge Number: HAM-50-1927
Culvert: 7	c53 Hydraulic Opening: 1	Inspection Date: 12/09/2019
Channel: 7		Division: District 8
		River: MSD Sanitary Sewer

Program Manager: Steve Mary, P.E.	Weather: Cloudy - Rain
Project Manager: Jason Sander, P.E.	Air Temperature: 46°
Team Leader: Jason Hickey	Water Temperature: 53°
Team Members: Adam Wolf, Zach Harrison (Diver) and Harold Widener	

Route: **US 50**
 Inventory Direction: **West to East**
 County: **Hamilton**
 Location: **N39°13'10.64", W84°31'54.95"**
 Bridge Length: **225'**
 Substructure Type: **Single Barrel Masonry Culvert**
 Foundation Type: **Unknown**
 Total Substructure Units: **1**
 Substructure Units in Water: **1**
 Water Depth: **18.7'**
 Water Velocity: **< .5 FPS**
 Underwater Visibility: **0'**



Summary of Scour and Channel Conditions:

The invert was not exposed, the invert was found to be covered with varying amounts of fine to course sand, and fine gravel. With build-up in areas estimated to 3 feet. Hydraulic opening is acceptable.

Summary of Culvert Conditions:

Inspected culvert is in good condition and shows no considerable change since the last inspection. No significant distressed masonry was noted.

Repair Recommendation:

No repairs are required at this time.





Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 12/09/2019

County: Hamilton State: Ohio

Description: Site Information

HAM-50-1927 is a U.S. Route that runs West to East. The route crosses over a combined sewer owned and operated by the City of Cincinnati, Department of Sewers – Stormwater Management Utility just east of the Mill Creek. It is our understanding the single barrel masonry culvert that carries US 50 at this location is state owned and measures approximately 225' in length.

The masonry culvert is a 12' diameter masonry lined structure. A flood gate structure is located just downstream of the access point. The street level manhole hole is located at elevation 483.5+/- and the invert elevation is located at 437.7+/- a difference of 45.8'+/-. The water elevation was 456.4 +/-.

Approximately 250 feet of the culvert was inspected, which was from right-of-way to right-of-way.

The inspection team accessed and entered the culvert through street level access chamber located near the end of West Mehring Way. Access was coordinated with;

Mr. Jeff Oxenham, P.E.

Jeff.Oxenham@cincinnati-oh.gov

513-591-7753-4900

The assessment was performed using surface-supplied air diving with a special emphasis on contaminated water diving techniques. An ODOT qualified bridge inspection team entered the structure on December 9, 2019. The engineering technician/diver was dressed at street level and was inserted and extracted using a man basket suspended from a crane.

Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 12/09/2019

County: Hamilton State: Ohio

Description: Culvert Field Notes

The engineering technician/diver entered the culvert at the only access point available which was the access chamber located in the middle of West Mehring Way. At the time of the assessment the culvert was fully submerged, and the effluent flow was estimated to be low with minimal velocity. The water level at the time of the assessment was 456.4+/- and the depth of effluent was approximately 18.7 feet.

After entering the culvert, the engineering technician/diver proceeded north within the tunnel systematically accessing the single barrel masonry culvert and invert. The visibility was zero and the assessment was performed solely using tactile methods.

The culvert was found to be debris laden with primarily trash related items i.e., plastic bottles, etc.

The masonry was found to be in good condition with minor isolated areas of mortar loss of the head and bed joint. No missing bricks were detected during tactile assessment, and no bricks were discovered in the invert. No settlement, shifting or bulging of the arch walls could be detected tactilely.

The invert was not exposed, the invert was found to be covered with varying amounts of fine to course sand, and fine gravel. With build-up in areas of approximately 3 feet.

Hydraulic opening is acceptable.

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Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 12/09/2019

County: Hamilton State: Ohio

Description: Access Point



Terracon

Consulting Engineers & Scientists

Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 12/09/2019
County: Hamilton State: Ohio
Description: Access Point



Photos
TERRACON

Terracon

Consulting Engineers & Scientists

Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 12/09/2019
County: Hamilton State: Ohio
Description: Access Shaft



Photos
TERRACON

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Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 10/08/2019
County: Hamilton State: Ohio
Description: Access Shaft – Diver Being Inserted



Photos
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Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 10/08/2019
County: Hamilton State: Ohio
Description: Diver Being Insert



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Structure ID #: HAM-50-1927, US 50 over Sanitary Sewer Culvert Date: 12/09/2019
County: Hamilton State: Ohio
Description: Diver Decontamination



ODOT MANUAL OF BRIDGE INSPECTION APPENDIX F - Underwater Inspection Procedure Checklist

Acceptable written procedures communicate to the next field inspection team leader what is necessary to ensure a safe and successful inspection. Each bridge requiring underwater diving techniques must have written inspection procedures specific to each bridge which address items unique to that bridge. The prior inspection report condition ratings and inspection comments, by themselves, do not suffice for the required procedures. It is valuable to review these items but they do not serve the same purpose as the inspection procedures. The inspection report records what an inspector actually did, what was looked at, and what was found. Procedures lay out what should be done, looked at, etc. Often consultant underwater reports will include a paragraph or section in the written report that communicates the underwater inspection procedures. This will often suffice as adequate inspection procedures and fulfill the intent of the FHWA requirement. This checklist is a framework and should be completed for all underwater diving inspections when inspection procedures do not exist.

I. Bridge Identification

a. Agency with Inspection Responsibility: **Terracon Consultants, Inc.**

Dive Frequency: 60 months

SFN: **3102890** Bridge Number (County-Route-SLM-SD): **HAM-50-1927**

Superstructure Type Main Span Type: **Single Barrel Masonry Arch**

Approach Span: **NA**

Substructure Type Abutment Type: **Masonry Arch**

Pier Type: **Reinforced Concrete**

Total Pier Count: **NA**

Total Pier Count in water: **NA**

Feature Intersected: **MSD Sanitary Sewer Culvert**

b. Photographs – Photographs are shown in the underwater inspection report for this structure.



Access Point



Shaft

II. Office and Field Assessment

Prior to the inspection, obtain and review copies of the previous underwater inspection reports, routine inspection reports and design plans in preparation of the inspection. Divers should pay particular attention given to any observed areas of deterioration, the channel conditions and factors that may accelerate material deterioration. Changes shall be noted in the inspection procedure. Site conditions should be reviewed prior to diving.

a. Channel Conditions

Waterway features

- NO** Rapid stream flows,
- YES** Significant debris accumulation
- NO** Constricted waterway openings
- NO** Soft or unstable streambeds
- NO** Meandering channels
- NA** Other (which may promote scour and undermining of substructure elements)
- NO** Navigable Waterway
- NO** Flow Controls

b. Anticipated Water conditions which may affect the inspection

- NO** Cold Water (Approx. Temp___)
- YES** Black water - limited
- NO** Rapid stream flows
- NA** Near military facility
- NA** Tribal fishing
- NO** Water quality
- NO** History of Log jams

c. Identify factors that may accelerate the deterioration of the bridge elements:

- NO** Highly corrosive water
- NO** Unprotected steel members
- NO** Other

Risk Factor Narrative:

Refer to report.

III. **Contacts Prior to Work**

(TO BE COMPLETED BY THE BRIDGE OWNER)

Point of contact for immediate action such as closing the bridge due to findings)

Contact Bridge Owner ___ (number) days before the proposed underwater inspection.

Special contracting and scheduling procedures prior to inspection, include recommended lead time

Entity	Contact Name and Title	Contact Phone	Lead Time
Coast Guard	NA	X	X
Property Owner	Mr. Jeff Oxenham, P.E. Jeff.Oxenham@cincinnati-oh.gov 513-591-7753-4900		X
Access Equipment	Crane	Terracon Subcontractor	NA
Lake or River draw-down	NA	NA	X
Canal dry time	NA	X	X
Tree removal	X	X	X
Other:			
Other:			

IV. **Dive Team Shall Include the Following:**

Dive Team Narrative:

Refer to report.

Example: The Bridge shall be investigated using a three-member dive team: one supervisor to monitor rack box and take notes, one diver, and one tender/standby diver. There shall be one NBIS Team Leader onsite at all times.

V. **Site Information**

Navigable waterway:	<u>NO</u>	Anticipated current	<u>,5 fps</u>
If Yes, (waterway river point)	<u>NA</u>	Scour Critical (item 113):	<u>NA</u>
Anticipated water visibility depth	<u>< 0' ft</u>	POA in place:	<u>NO</u>
Anticipated Dive depth	<u><25 ft</u>	Scour Monitoring devices present:	<u>NO</u>

Verify the Scope of Services when work is contracted for the procedure for underwater elements that are not in water during an inspection. **NA**

Site Information Narrative: **NA**

Refer to report.

The underwater inspection consists of a visual and tactile examination of the accessible surfaces of the substructure items in water. Additional items should reference the scope of services in the contract.

For reference the following items are in water: (FILL in number only if in water...IF NONE, put 0)

Item	Number of Units	Level of Inspection (1, 2 or 3) with Commentary
Piers and Number of Columns	0	Refer to report, as applicable
Abutment	0	Refer to report, as applicable
Culvert	1	Refer to report, as applicable
Scour Countermeasures	0	Refer to report, as applicable
Fenders or Dolphins	0	Refer to report, as applicable

Photographs should be taken, if water clarity permits, for typical conditions, conditions that have changed since last inspection and significant or noteworthy deficiencies. The type of channel bottom material, the presence or extent of scour, the presence or extent of riprap, the presence or extent of drift and debris, and the location of any foundation exposure or undermining shall be quantified. Include depth, length, height and location of deficiencies.

VI. Equipment and Field Logistics

a. The inspection should be conducted using:

NA Chest waders

NA Hip waders

YES Diving equipment

NA SCUBA (Note that ADCI Consensus Standards require communication systems be employed for both SCUBA and Surface-Supplied (whether air or mixed-gas) dive modes)

N) SCUBA with communication

YES Surface Supplied with communication

b. The channel bottom should be sounded utilizing

No Digital fathometer

No Telescoping survey rod

_____ acoustic imaging

c. During the inspection, the divers should work from

_____ Boat

X Shore

_____ Either

The note taker should work alongside the dive team.

d. Access to the waterway should be obtained from the shore (north bank, southwest quadrant, driveway 30 yards north etc.)

Diver inserted via crane and Manbasket

e. The maximum depth of the channel is typically measured _____ feet from

Reference Datum _____

Soundings should be dictated by the scope of work. When not detailed in the scope they should be repeated from the previous soundings. If neither exist, then they need to be taken in a grid pattern between substructure units 100' upstream and 100' downstream.

VII. Other Narrative Not Included In Previous Sections

Refer to report.

**STATE OF OHIO
BRIDGE INSPECTION FIELD REPORT**

SFN 3102890
DIST 08

Bridge Number HAM-50-1927
Feature Intersect... MSDGC -Sanitary Sewer

Year Built 1927
Municipality

	Qty.	condition state				cr	
		1	2	3	4	TR	
c1. Wearing Surface (EA)							
c2. Slab (SF)							
c3. Relief Joint (LF)							
c4. Embankment (EA) ^{ded}							
c5. Guardrail (EA)							
N36. Safety Features: Tr, Gr, Tm							
c6. Approach Summary							

	Qty.	condition state				cr	
		1	2	3	4	TR	
c7.1 Floor/Slab (SF)							
c7.2 Edge of Floor/Slab (LF)							
c8. Wearing Surface (SF)							
c9. Curbs/Sidewalk (LF)							
c10. Median (LF)							
c11. Railing (LF)							
N36. Safety Features: Rail							
c12. Drainage (EA) ^{ded}							
c13. Expansion Joint (LF) ^{ded}							
N58. Deck Summary							

	Qty.	condition state				cr	
		1	2	3	4	TR	
c14. Alignment (EA) ^{ded}							
c15.1 Beams/Girders (LF)							
c15.2 Slab (SF)							
c16. Diaphragm/X-Frames (EA)							
c17. Stringers (LF)							
c18. Floorbeams (LF)							
c19. Truss Verticals (EA)							
c20. Truss Diagonals (EA)							
c21. Truss Upper Chord (EA)							
c22. Truss Lower Chord (EA)							
c23. Truss Gusset Plate (EA) ^{ded}							
c24. Lateral Bracing (EA)							
c25. Sway Bracing (EA)							
c26. Bearing Devices (EA) ^{ded}							
c27. Arch (LF)							
c28. Arch Column/Hanger (EA)							
c29. Arch Spandrel Walls (LF)							
c30. Prot. Coating System (LF) ^{ded}							
c31. Pins/Hangers/Hinges (EA) ^{ded}							
c32. Fatigue (LF) ^{ded}							
N59. Superstructure Summary							

	Qty.	condition state				cr	
		1	2	3	4	TR	
c33. Abutment Walls (LF)							
c34. Abutment Caps (LF)							
c35. Abut. Colmns/Bents (EA)							
c36. Pier Walls (LF)							
c37. Pier Caps (LF)							
c38. Pier Column/Bents (EA)							
c39. Backwalls (LF)							
c40. Wingwalls (EA)							
c42. Scour (EA) ^{ded}							
c43. Slope Protection (EA) ^{ded}							
N60. Substructure Summary							

	Qty.	condition state				cr	
		1	2	3	4	TR	
c44. General (LF)	225	225					1
c45. Alignment (LF) ^{ded}	225	225					1
c46. Shape (LF) ^{ded}							
c47. Seams (EA) ^{ded}							
c48. Headwall/Endwall (EA)							
c49. Scour (EA) ^{ded}							1
c50. Abutments (LF)							
N62. Culvert Summary							7

	Qty.	condition state				cr	
		1	2	3	4	TR	
c51. Alignment (LF) ^{ded}							
c52. Protection (LF) ^{ded}							
c53. Hydraulic Opening (EA) ^{ded}	1	1					1
c54. Navigation Lights (EA) ^{ded}							
N61. Channel Summary							7

	Qty.	condition state				cr	
		1	2	3	4	TR	
c55. Signs (EA) ^{ded}							
c56. Sign Supports (EA) ^{ded}							
c57. Utilities (LF) ^{ded}							
N59, 60 or 62 General Appraisal							
N41. Operating Status							

Inspector Name Zach Harrison
Inspection Date/Type 12/9/2019
Reviewer Name Jason Hickey, P.E.
Review Date 12/09/2019
PE Number (Insp or Rev) E 80700