

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. L5733
ABANDONED RAILROAD
OVER THE
MISSISSIPPI RIVER
CITY OF MINNEAPOLIS, HENNEPIN COUNTY



OCTOBER 29, 2012
PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. L5733, the East and West Piers, were found to be in good condition with no defects of structural significance observed. The stone masonry was in good condition with only minor hairline cracks observed in the mortar joints at random locations. The top of the footing at the West Pier was partially exposed at the upstream end. The channel bottom appeared stable with no significant scour observed and with minimal changes since the last inspection.

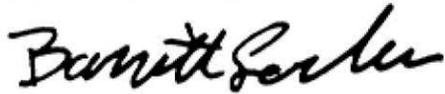
INSPECTION FINDINGS:

- (A) The channel bottom material consisted of sand infilling at the downstream end of both piers allowing up to 1 foot of probe rod penetration, and a combination of 1 to 2 foot diameter riprap at the upstream end and smaller 6 to 8 inch diameter cobbles/riprap along the sides of both piers.
- (B) The top of the footing was partially exposed around the upstream half of the West Pier with no vertical face exposure present.
- (C) The stone masonry was in good condition with minor hairline to 1/8 inch (maximum) wide cracks observed in the mortar joints at random locations.
- (D) A light accumulation of steel debris was observed scattered on the channel bottom around both piers.

RECOMMENDATIONS:

- (A) Monitor the extent of footing exposure during future underwater inspections.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:
WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

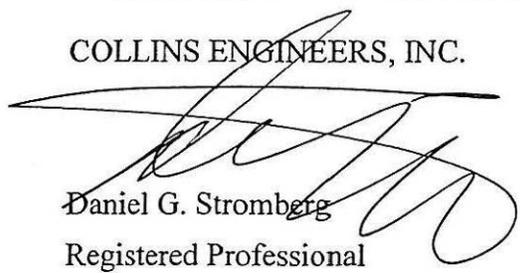
PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/14 License # 21491

COLLINS ENGINEERS, INC.



Daniel G. Stromberg

Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: L5733

Feature Crossed: Mississippi River

Feature Carried: Abandoned Railroad

Location: City of Minneapolis, Hennepin County

Bridge Description: The superstructure consists of a steel deck truss and is supported by two stone masonry block piers for the portion of bridge across the waterway. Design plans were not available; therefore footing design information is unknown.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt R. Lovelace, P.E. (WSB)

Dive Team: Marc B. Parker, Lukas Janulis, P.E.

Date: October 29, 2012

Weather Conditions: Cloudy, 40°F

Underwater Visibility: 2 feet

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Piers.

General Shape: The piers consist of an oblong rectangular shaft with pointed noses constructed of stone masonry blocks. The type of support for the rectangular pier footings is unknown.

Maximum Water Depth at Substructure Inspected: Approximately 17.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the stone masonry step in the shaft at the south end of the East Pier.

Water Surface: The waterline was approximately 12.8 feet below reference.
Assumed Waterline Elevation = 87.2.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/12

Item 113: Scour Critical Bridges: Code A

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
211	Masonry Pier Wall	108	LF	108				
985	Slopes and Slope Protection	1	EA	1				



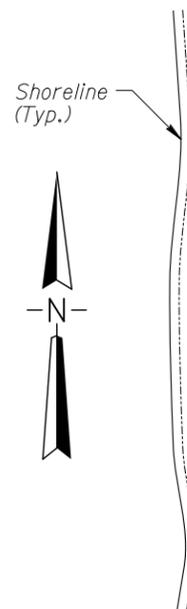
Photograph 1. View of West Pier, Looking Northwest.



Photograph 2. View of East Pier, Looking Northeast.

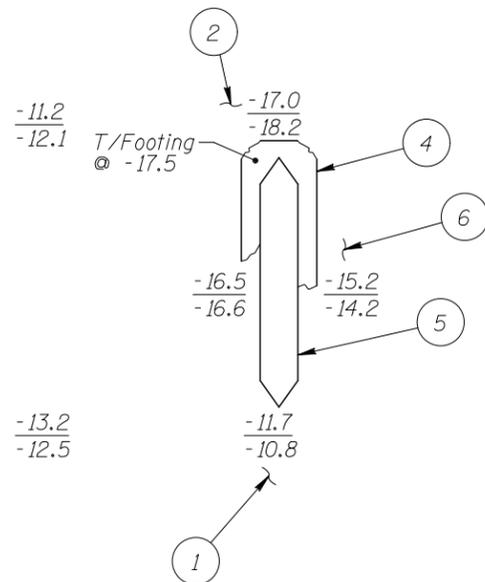


Photograph 3. Overall View of Structure, Looking North.



-8.0
-7.9

-3.2
-6.6



West Pier

-17.2
-14.4

-14.6
-15.1

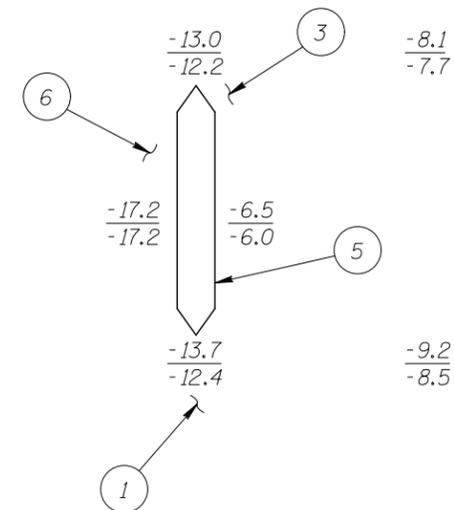
-15.2
-15.0

-14.3
-15.7

Flow
Mississippi River

-13.6
-17.1

-14.7
-17.8



East Pier

-8.1
-7.7

-9.2
-8.5

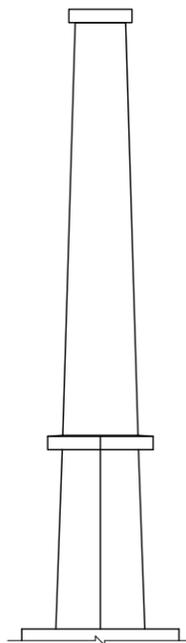
SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material consisted of sand infilling at the downstream end of both piers allowing up to 1 foot of probe rod penetration.
- 2 The channel bottom material consisted of riprap 1 to 2 feet in diameter at the upstream nose and 6 to 8 inch diameter riprap and sand along both sides of the West Pier.
- 3 The channel bottom consisted of riprap 1 to 4 feet in diameter at the upstream nose and 6 to 8 inch diameter riprap and sand along both sides of the East Pier.
- 4 The top of the footing was partially exposed from the quarter point along the west face, around the upstream nose, and to the midpoint along the east face. No vertical face exposure was present.
- 5 The stone masonry was in good condition with minor hairline to 1/8 inch (maximum) wide cracks observed in the mortar joints at random locations.
- 6 A light accumulation of steel debris was observed scattered on the channel bottom around both piers.

GENERAL NOTES:

1. The East and West Piers were inspected underwater.
2. At the time of inspection on October 29, 2012, the waterline was located approximately 12.8 feet below the top of the stone masonry step in the shaft at the downstream end of the East Pier. Since design drawings were not available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 87.2.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.



TYPICAL END VIEW OF PIERS

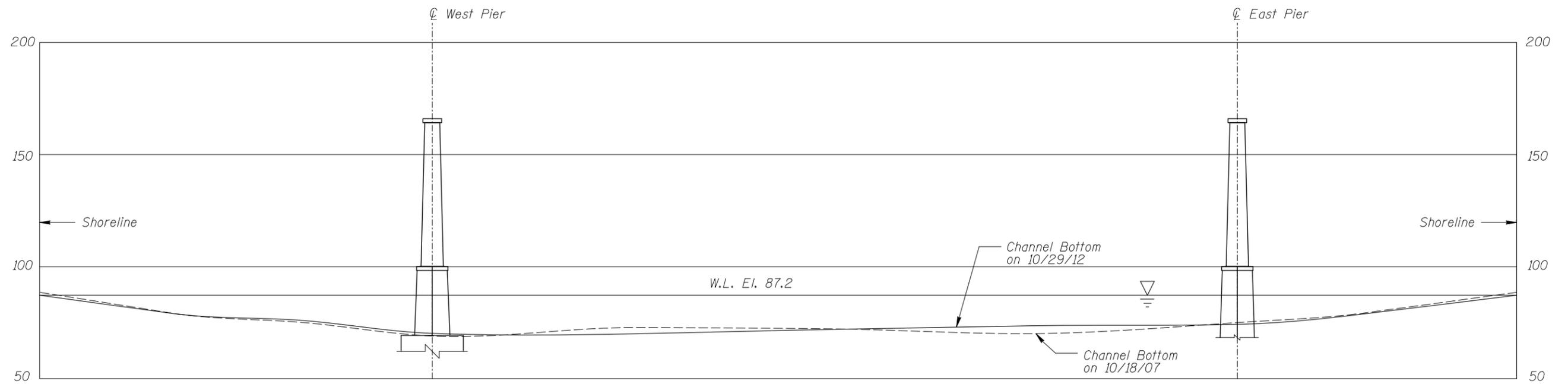
Legend

-5.2 Sounding Depth (10/29/12)
-4.8 Sounding Depth (10/18/07)

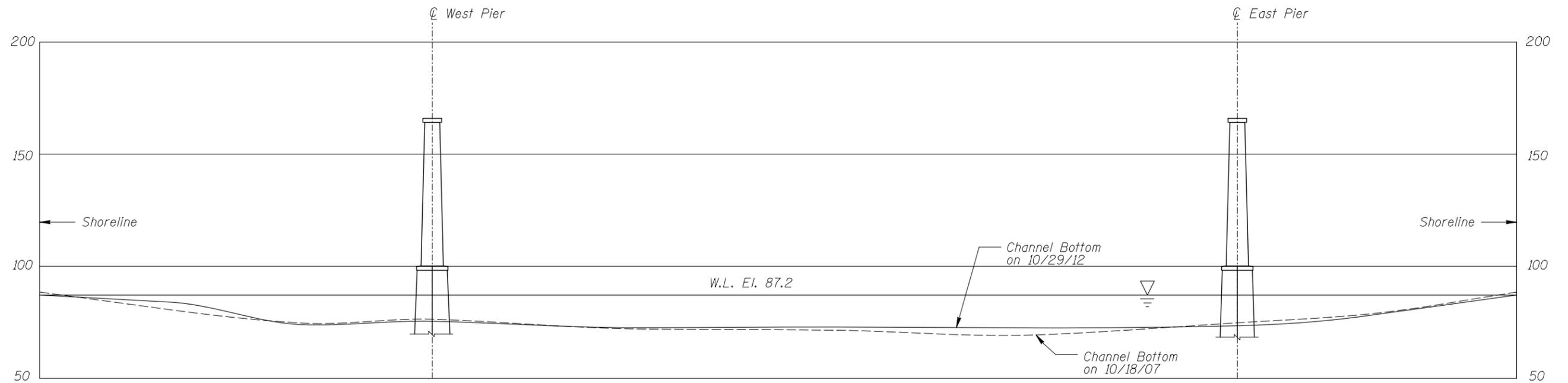
Note:

All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. L5733 OVER THE MISSISSIPPI RIVER HENNEPIN COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: CRE	COLLINS ENGINEERS	Date: OCT., 2012
Checked By: LJ		Scale: NTS
Code: 7423L5733		Figure No.: 1
123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com		



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. L5733 OVER THE MISSISSIPPI RIVER HENNEPIN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: CRE	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT., 2012
Checked By: LJ		Scale: NTS
Code: 7423L5733		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 29, 2012

ON-SITE TEAM LEADER: Barritt R. Lovelace, P.E. (WSB)

BRIDGE NO: L5733 WEATHER: Cloudy, 40°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Marc B. Parker, Lukas Janulis, P.E.

EQUIPMENT: Commercial Scuba, Sounding Pole, Camera, u/w Light, 14 ft Boat, Probe Rod, Lead Line

TIME IN WATER: 2:40 P.M.

TIME OUT OF WATER: 3:10 P. M.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 2.0 feet

DEPTH 17.5 feet maximum at the West Pier

ELEMENTS INSPECTED: East and West Piers

REMARKS: Overall, substructure units inspected were in good condition with no structurally significant defects observed. The stone masonry was in good condition with only minor hairline cracks observed in the mortar joints at random locations. The top of the footing at the West Pier was exposed at the upstream end. The channel bottom appeared stable with no significant scour observed and with minimal changes since the last inspection.

FURTHER ACTION NEEDED: YES NO

Monitor the extent of footing exposure during future underwater inspections.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. L5733
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.(WSB)
 WATERWAY CROSSED The Mississippi River

INSPECTION DATE October 29, 2012

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE					CHANNEL					GENERAL						
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER (MASONRY)
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	West Pier	17.5'	N	7	7	8	N	7	7	N	N	7	6	N	N	N	N	N	7
	East Pier	17.2'	N	7	N	8	N	7	N	N	N	7	7	N	N	N	N	N	7

*UNDERWATER PORTION ONLY

REMARKS: Overall, substructure units inspected were in good condition with no structurally significant defects observed. The stone masonry was in good condition with only minor hairline cracks observed in the mortar joints at random locations. The top of the footing at the West Pier was exposed at the upstream end. The channel bottom appeared stable with no significant scour observed and with minimal changes since the last inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.