

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7685

CSAH 24

OVER

HAWKINSON CREEK

ST. LOUIS COUNTY



JUNE 21, 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 7685, the West Abutment, Bent 1, and the East Abutment, were generally in good condition with no appreciable deterioration or any other significant deficiencies. The timber piles, pile caps, cross-braces, and backwall were all in good and sound condition with no notable deterioration or indications of decay. One brace-to-pile connection was compromised due to a split through the brace, and three of the piles at the West Abutment exhibited only 50 percent bearing at the cap, although the abutment was still sound and stable.

INSPECTION FINDINGS:

- (A) All the timber piles were in good condition with only minor checking. There was no notable loss of section or indications of decay. The timber typically allowed a awl penetration of 1/8 inch.
- (B) Only half of the pile cap was bearing on Piles C, D, and E of the West Abutment. The pile cap was not properly seated on Piles C, D, and E of the West Abutment.
- (C) A split 5 feet long by 1 inch wide was observed on the cross-brace at Pile A of Bent 1. Due to the split, the Pile A to cross-brace connection was compromised.
- (D) A light accumulation of branchy debris and soft silty infill was observed on the west side along the downstream half of Bent 1. The channel bottom depth in this area ranged from 1 to 2 feet deep.
- (E) The channel bottom material consisted of sandy silt typically allowing 6 inches of probe rod penetration.

RECOMMENDATIONS:

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

Inspection Team Leader:
Daniel G. Stromberg, P.E.

Respectfully submitted,

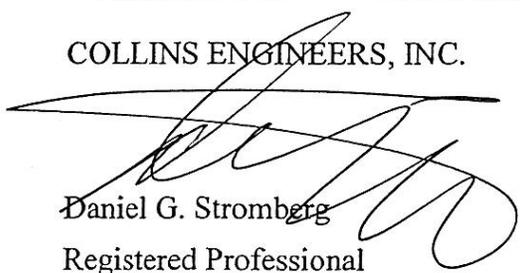
PROFESSIONAL ENGINEER

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: 7685

Feature Crossed: Hawkinson Creek

Feature Carried: CSAH 24

Location: St. Louis County

Bridge Description: The superstructure consists of timber decking supported by steel beams. The superstructure is supported by two abutments and a pile bent. Both abutments and the pile bent consist of six timber piles supporting a timber pile cap. The substructure units are designated as the West Abutment, Bent 1, and the East Abutment. Piles are designated A through F from north to south.

2. INSPECTION DATA

Professional Engineer/ Team Leader: Daniel G. Stromberg, P.E.

Dive Team: Clayton Brookins, Breanne Stromberg

Date: June 21, 2012

Weather Conditions: Sunny, 75 °F

Underwater Visibility: 2 ft.

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: The West Abutment, Bent 1, and the East Abutment

General Shape: The West and East Abutments and Bent 1 consisted of a 12 inch by 12 inch timber pile cap supported by six 12 inch diameter timber piles. Bent 1 has two diagonal 3 inch by 12 inch timber cross-braces. The backwalls and wingwalls were comprised of timber piles and timber lagging.

Maximum Water Depth at Substructure Inspected: Approximately 5.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pile cap at the upstream end of Bent 1.

Water Surface: The waterline was approximately 1.0 feet below reference.

Assumed Waterline Elevation: 99.0

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/06/12

Item 113: Scour Critical Bridges: Code I

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
228	Timber Piling	18	EA	15	3			
216	Timber Abutment	56	LF	42	14			



Photograph 1. View of the Upstream Fascia, Looking Southeast.



Photograph 2. View of the Downstream Fascia, Looking North.



Photograph 3. View of the West Abutment, Looking Southwest.



Photograph 4. View of Bent 1, Looking Northeast.



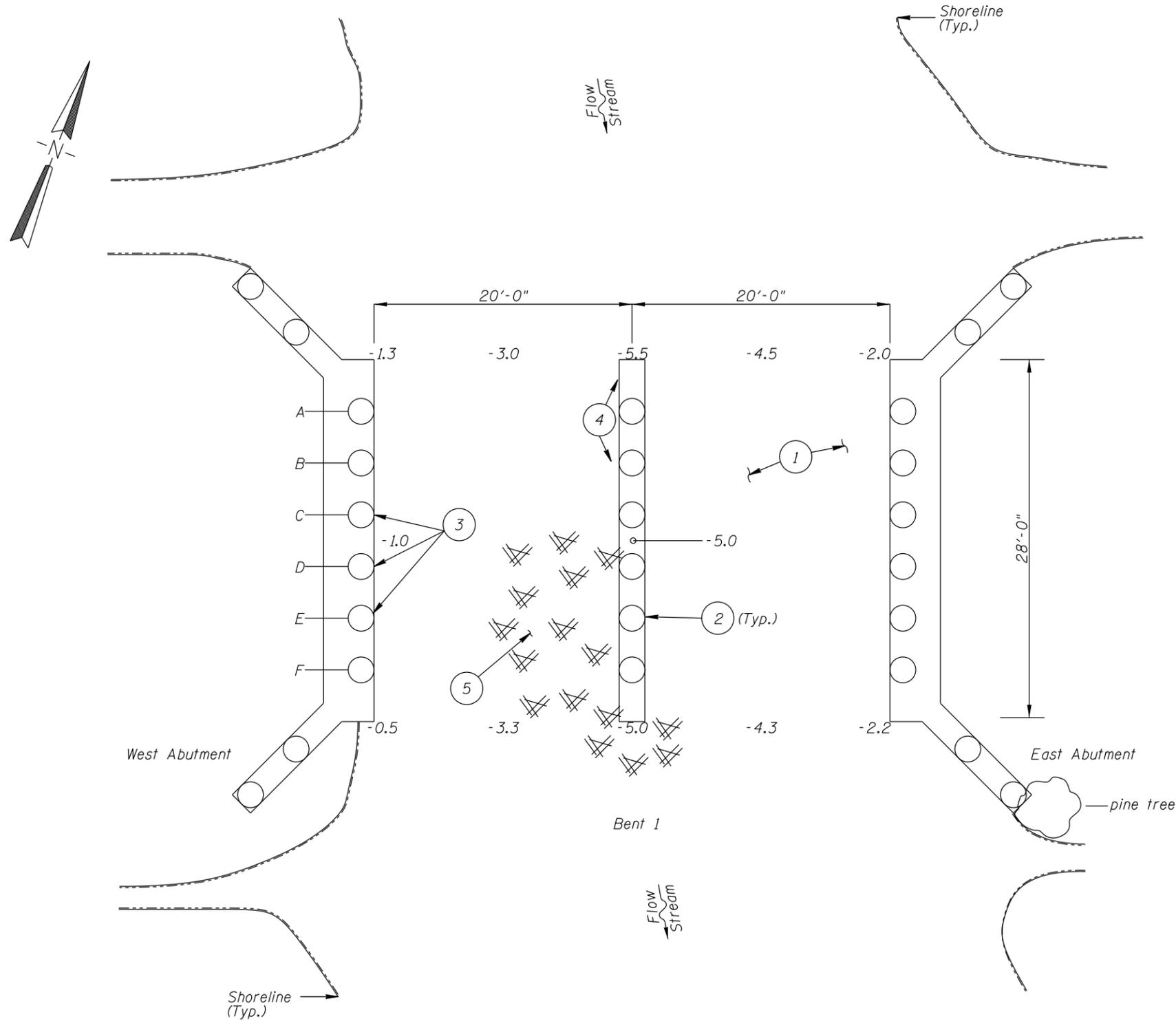
Photograph 5. View of the East Abutment, Looking Northeast.



Photograph 6. View of Partial Pile Cap Bearing on Pile D of the West Abutment, Looking Southwest.

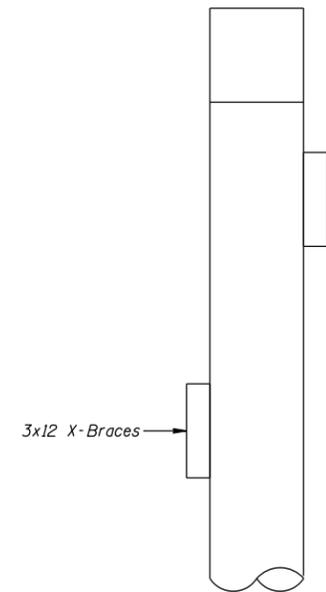


Photograph 7. View of the Typical Condition of the Wingwalls at the Downstream side of the East Abutment, Looking Northeast.



INSPECTION NOTES:

- 1 The channel bottom material consisted of sandy silt typically allowing 6 inches of probe rod penetration.
- 2 All the timber piles were in good condition with only minor checking. There was no notable loss of section or indications of decay. The timber typically allowed a awl penetration of 1/8 inch.
- 3 Only half of the pile cap was bearing on Piles C, D, and E of the West Abutment. The pile cap was not properly seated on Piles C, D, and E of the West Abutment.
- 4 A split 5 feet long by 1 inch wide was observed on the cross-brace at Pile A of Bent 1. Due to the split, the Pile A to cross-brace connection was compromised.
- 5 A light accumulation of branchy debris and soft silty infill was observed on the west side along the downstream half of Bent 1. The channel bottom depth in this area ranged from 1 to 2 feet deep.



TYPICAL END VIEW OF BENTS

GENERAL NOTES:

1. The East and West Abutments and Bent 1 were inspected underwater.
2. At the time of inspection, on June 21, 2012, the waterline was located approximately 1.0 foot below the top of the cap at the upstream end of Bent 1. Due to lack of design plan information, the reference elevation was assumed to be 100.0 feet. This corresponds to waterline elevation of 99.0 feet.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to north and south fascias at 1/2 point intervals.

Legend

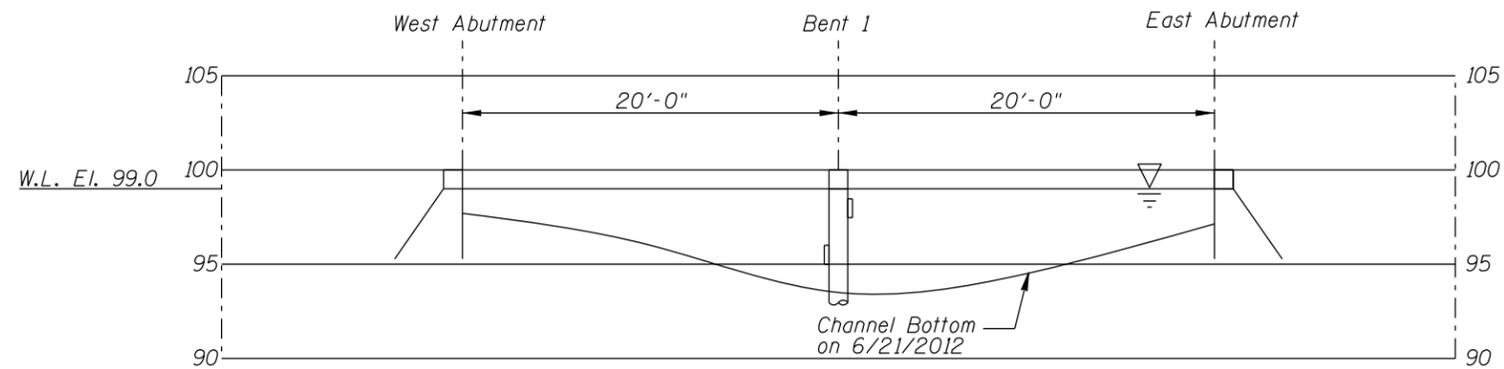
- 0.4 Sounding Depth (6/21/12)
- Timber Debris
- 12 inch Diameter Timber Piles

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

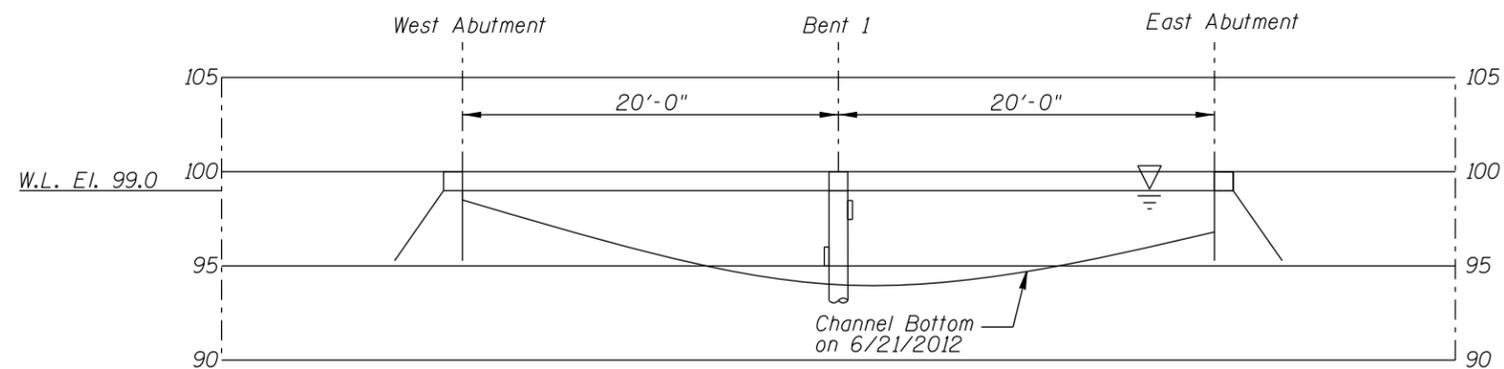
STRUCTURE NO. 7685
CSAH 24 OVER HAWKINSON CREEK
ST LOUIS COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: BMS		<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: JULY 2012
Checked By: LJ			Scale: NTS
Code: 74237685			Figure No.: I



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

 Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 7685 CSAH 24 OVER HAWKINSON CREEK ST LOUIS COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BMS	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: JULY 2012
Checked By: LJ		Scale: NTS
Code: 74237685		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: June 21, 2012

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 7685 WEATHER: Sunny, 75°F

WATERWAY CROSSED: Hawkinson Creek

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton Brookins, Breanne Stromberg

EQUIPMENT: Commercial Scuba, U/W Light, Hand Tools, Sounding Pole, Lead Line, Probe Rod,
Camera

TIME IN WATER: 5:15 P.M.

TIME OUT OF WATER: 6:15 P.M.

WATERWAY DATA: VELOCITY < 0.5 ft/sec

VISIBILITY 2 ft

DEPTH 5.5 feet maximum at Bent 1

ELEMENTS INSPECTED: The West and East Abutment and Bent 1

REMARKS: Overall, the West Abutment, Bent 1, and the East Abutment, were generally in good condition with no appreciable deterioration or any other significant deficiencies. The timber piles, pile caps, cross-braces, and backwalls were all in good and sound condition with no notable deterioration or indications of decay. One brace-to-pile connection was compromised due to a split through the brace, and three of the piles at the west abutment exhibited only 50 percent bearing at the cap, although the abutment was still sound and stable.

FURTHER ACTION NEEDED: YES NO

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

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 7685
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E.
 WATERWAY CROSSED Hawkinson Creek

INSPECTION DATE June 21, 2012

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING 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 (PILE BEARING)	OTHER (BRACING)	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
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	East Abutment	2.2'	7	N	N	8	N	7	N	7	N	7	7	N	N	7	8	N	N
	Bent 1	5.5'	7	N	N	8	6	7	N	N	N	6	6	N	N	7	8	N	N
	West Abutment	1.3'	7	N	N	6	N	7	N	7	N	7	7	N	N	7	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the West Abutment, Bent 1, and the East Abutment, were generally in good condition with no appreciable deterioration or any other significant deficiencies. The timber piles, pile caps, cross-braces, and backwall were all in good and sound condition with no notable deterioration or indications of decay. One brace-to-pile connection was compromised due to a split through the brace, and three of the piles at the west abutment exhibited only 50 percent bearing at the cap, although the abutment was still sound and stable.

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.