

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27538
CSAH NO. 52 (HENNEPIN AVENUE)
OVER THE
EAST CHANNEL OF THE MISSISSIPPI RIVER
DISTRICT 5 - HENNEPIN COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 119)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 27538, Piers 2 and 3, were found to be in good condition with no defects of structural significance observed. A light accumulation of timber debris was observed along the upstream nose of Pier 2. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

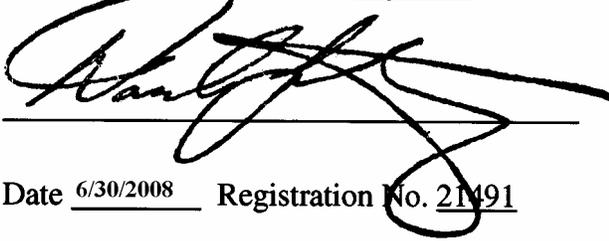
- (A) A scour depression, 3 feet in diameter and 1 foot deep, was observed at the upstream east corner of Pier 2. A 3 inch layer of silty sand was found on top of the footing, but neither vertical exposure nor top of footing exposure was observed.
- (B) A light accumulation of timber debris, mainly smaller branches, was observed on the channel bottom at the upstream nose of Pier 2. Also, a 1 foot diameter log was observed along the west face of Pier 2.
- (C) Vertical cracks, 1/16 inch maximum width, were observed at both faces of Pier 2 (4 on each face) extending from the channel bottom to the top of the pier shaft.
- (D) Vertical cracks, 1/16 inch maximum width, were observed at both faces of Pier 3 (4 on west face and 5 on east face) extending from the channel bottom to the top of the pier shaft, typically.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

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

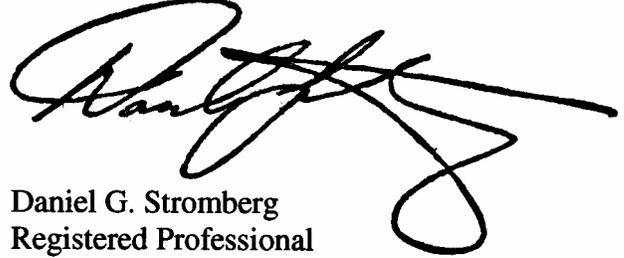


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27538

Feature Crossed: East Channel of the Mississippi River

Feature Carried: CSAH No. 52 (Hennepin Avenue)

Location: District 5 – Hennepin County

Bridge Description: The bridge superstructure consists of four spans of multiple steel beams. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The piers are numbered 1 through 3 starting from the west end of the bridge. Piers 1 through 3 are supported by spread footings founded on sandstone.

2. INSPECTION DATA

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

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 4, 2007

Weather Conditions: Sunny, 65°F

Underwater Visibility: 0.5 feet

Waterway Velocity: 0.5 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: Piers 1 and 2 are rectangular with two columns and an open web that sit on a lower rectangular shaft with rounded noses. The piers are founded on a rectangular spread footing which is founded on sandstone.

Maximum Water Depth at Substructure Inspected: Approximately 7.9 feet.

4. WATERLINE DATUM

Water Level Reference: The benchmark reference at Elevation 803.5 located on Pier 3.

Water Surface: The waterline was approximately 4.4 feet below reference.

Waterline Elevation = 798.7.

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 7

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code N/02

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

 Yes X No



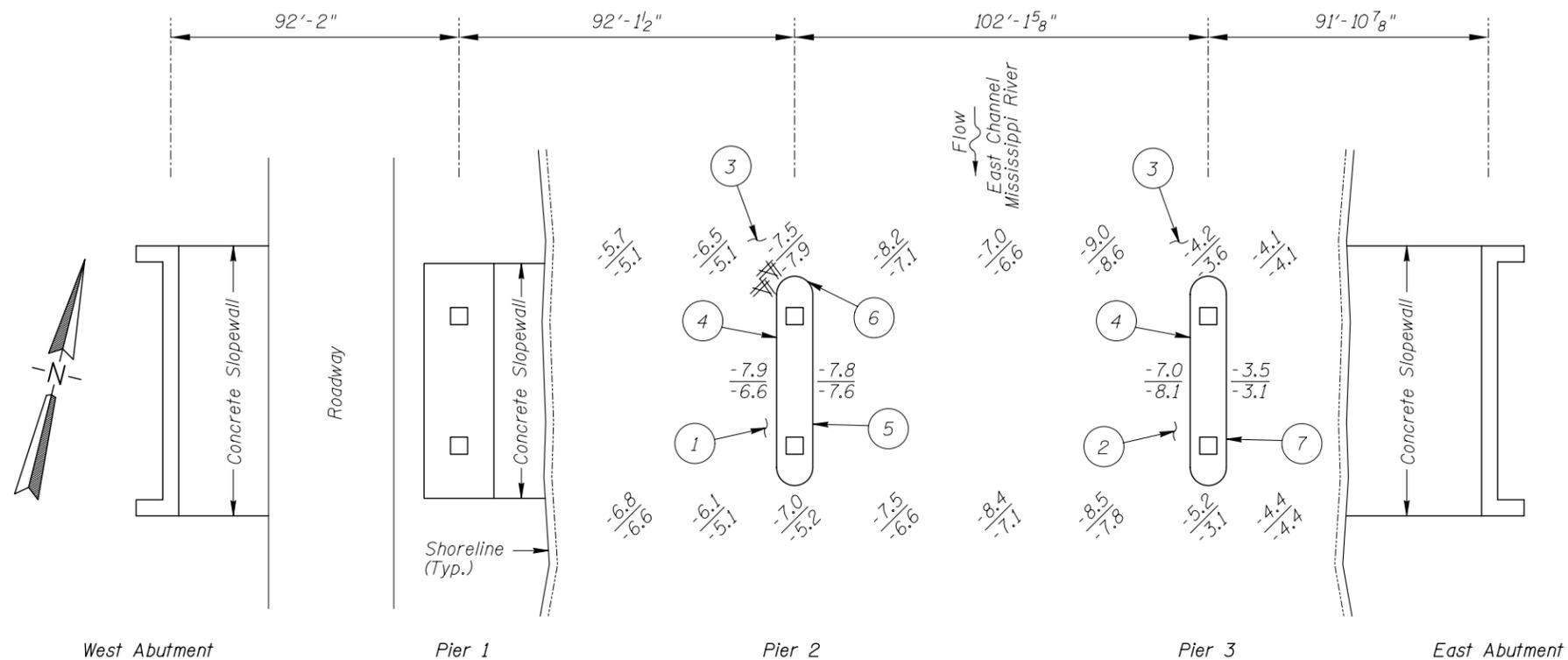
Photograph 1. Overall View of Structure, Looking East.



Photograph 2. View of Pier 2, Looking Southwest.



Photograph 3. View of Pier 3, Looking Southeast.

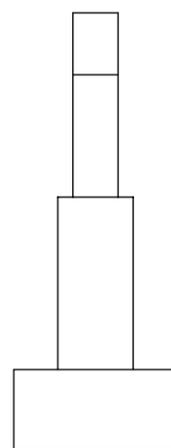


GENERAL NOTES:

- Piers 2 and 3 were inspected underwater.
- At the time of inspection on October 1, 2007 the waterline was located approximately 4.4 feet below the benchmark reference at Elevation 803.5 on Pier 3. Based on the reference this corresponds with a waterline elevation of 798.7.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom material around Pier 2 consisted of silty sand with up to 1 foot of probe rod penetration.
- The channel bottom material around Pier 3 consisted of silty sand with up to 1 foot of probe rod penetration and scattered riprap typically less than 1 foot in diameter except at the pier noses where the riprap was 2 to 4 feet in diameter.
- Light accumulation of timber debris, mainly smaller branches, was observed on the channel bottom at the upstream nose of Pier 2. A 1-foot-diameter log was observed along the West face of Pier 2.
- The concrete at Piers 1 and 2 exhibited minor scaling with up to 1/8 inch penetration.
- Vertical cracks (1/16 inch maximum width) were observed at both faces of Pier 2 (4 on each face) extending from channel bottom to top of the pier shaft.
- Scour depression 3-foot-diameter and 1-foot-deep was observed at the upstream east corner of Pier 2. A 3 inch layer of silty sand was found on top of footing. No footing exposure was observed.
- Vertical cracks (1/16 inch maximum width) were observed at east face of Pier 3 (5 cracks) and west face of Pier 3 (4 cracks) extending from channel bottom to top of the shaft (typically).



TYPICAL END VIEW OF PIERS 2 AND 3

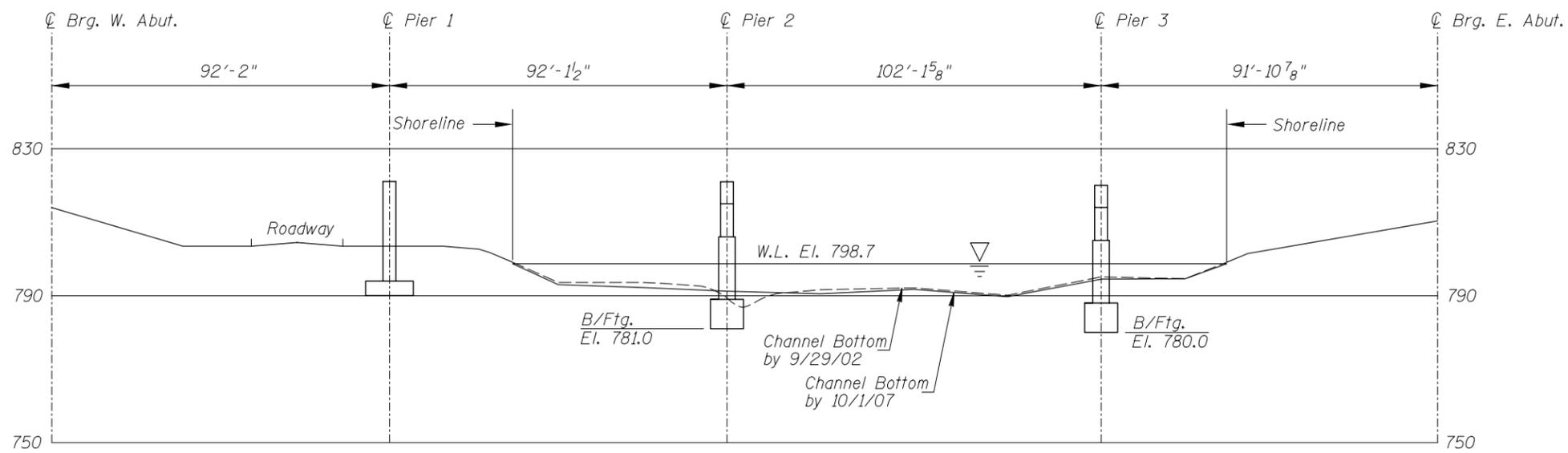
Legend

- 3.0 Sounding Depth (10/1/07)
- 3.0 Sounding Depth (9/28/02)
- Timber Debris

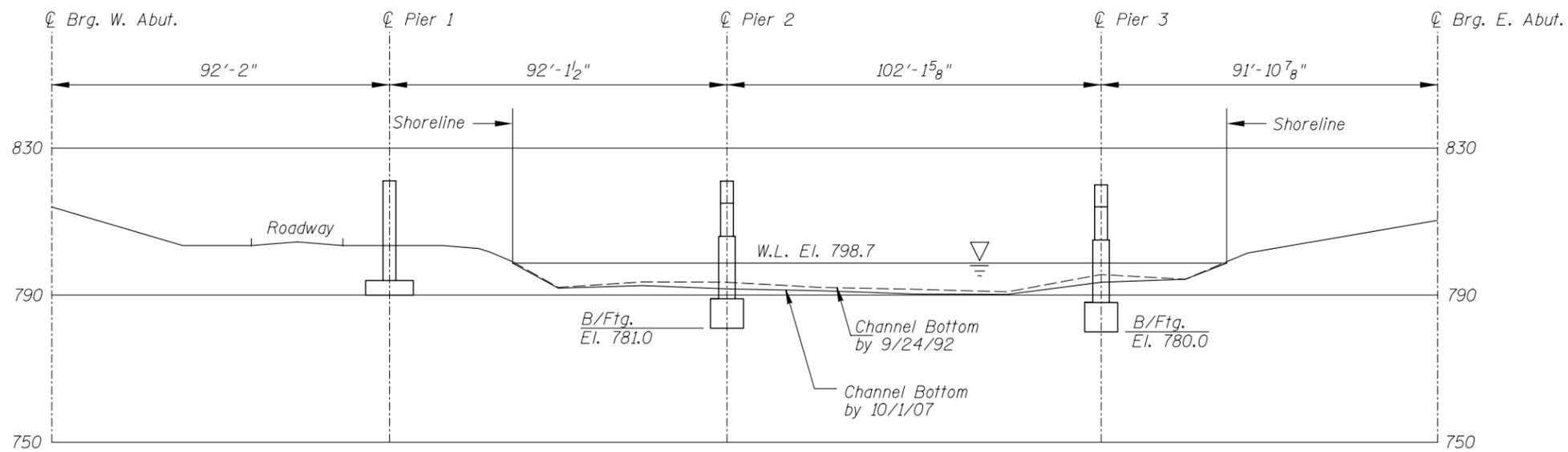
Note:

All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27538 OVER THE EAST CHANNEL OF THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT., 2007
Checked By: MDK		Scale: NTS
Code: 52210119		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27538 OVER THE EAST CHANNEL OF THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT., 2007
Checked By: MDK		Scale: 1"=40'
Code: 52210119		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: October 4, 2007

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

BRIDGE NO: 27538 WEATHER: Sunny, 65°F

WATERWAY CROSSED: East Channel of the Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Probe Rod, Lead Line, Fathometer, Sounding Pole,
Scraper, Camera

TIME IN WATER: 1:00 p.m.

TIME OUT OF WATER: 1:20 p.m.

WATERWAY DATA: VELOCITY 0.5 f.p.s

VISIBILITY 0.5 feet

DEPTH 7.9 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete of the piers was smooth and sound with minor scaling with 1/8 inch maximum penetration. A light accumulation of timber debris, mainly smaller branches, was observed on the channel bottom at the upstream nose of Pier 2. There was a scour depression at the upstream east corner of Pier 2 with no footing exposure. Vertical cracks, 1/16 inch maximum width, were observed on both faces of Piers 2 and 3. The channel bottom material around Piers 2 and 3 consisted of silty sand with up to 1 foot maximum probe rod penetration. Around Pier 3 there was also scattered riprap found with a maximum diameter of 4 feet.

FURTHER ACTION NEEDED: YES NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 27538
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED East Channel of the Mississippi River

INSPECTION DATE October 04, 2007
 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	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
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 2	7.9'	N	7	7	9	N	7	7	8	8	8	7	7	N	N	N	N	N
	Pier 3	7.0'	N	7	N	9	N	7	8	8	8	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was smooth and sound with minor scaling with 1/8 inch maximum penetration. A light accumulation of timber debris, mainly smaller branches, was observed on the channel bottom at the upstream nose of Pier 2. There was a scour depression at the upstream east corner of Pier 2 with no footing exposure. Vertical cracks, 1/16 inch maximum width, were observed on both faces of Piers 2 and 3. The channel bottom material around Piers 2 and 3 consisted of silty sand with up to 1 foot maximum probe rod penetration. Around Pier 3 there was also scattered riprap found with a maximum diameter of 4 feet.

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.