

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 27537  
1<sup>ST</sup> AVENUE  
OVER THE  
EAST CHANNEL OF THE MISSISSIPPI RIVER  
DISTRICT 5 - HENNEPIN COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
COLLINS ENGINEERS, INC.  
JOB NO. 3512 (CEI 118)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 27537, Piers 2 and 3, were found to be in good condition with no defects of structural significance observed. Light to moderate accumulations of timber debris were observed along the upstream noses of Piers 2 and 3. Light scaling was observed at both piers near the waterline. The channel bottom appeared stable with no evidence of significant scour and with no significant changes since the 1992 inspection.

INSPECTION FINDINGS:

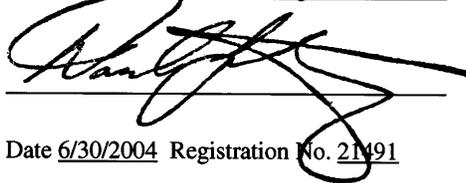
- (A) The concrete piers exhibited light scaling on their shaft surfaces from 1 foot above to 1 foot below the waterline.
- (B) Steel sheet piling was observed along the south face of Pier 3 from the upstream quarter point to the downstream nose, and it typically extended 1 foot above the channel bottom.
- (C) A light accumulation of timber debris was observed at the upstream end of Pier 2 on the channel bottom.
- (D) A moderate accumulation of timber debris, including a 20-foot-long log that was 1 foot in diameter, was observed at the upstream end of Pier 3 extending from the channel bottom to the waterline.

RECOMMENDATIONS:

- (A) Monitor the timber debris at Piers 2 and 3, and if found to be increasing in the future, removal operations may become warranted.
  
- (B) 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

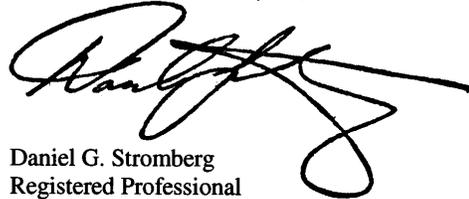


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2004 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: 27537

Feature Crossed: The East Channel of the Mississippi River

Feature Carried: 1<sup>ST</sup> 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 have spread footings that are keyed into rock, and the abutments are supported by timber piles. The piers are numbered 1 through 3 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 29, 2002

Weather Conditions: Overcast, " 55E' F

Underwater Visibility: " 1 foot

Waterway Velocity: Negligible / None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2 and 3

General Shape: Piers 2 and 3 each consist of two square columns which are supported by a rectangular shaft with rounded noses. The pier footings are rectangular and are keyed into rock.

Maximum Water Depth at Substructure Inspected: Approximately 9.7 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 3.0 feet below reference.  
Waterline Elevation = 799.1.

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

Item 60: Substructure: Code 7

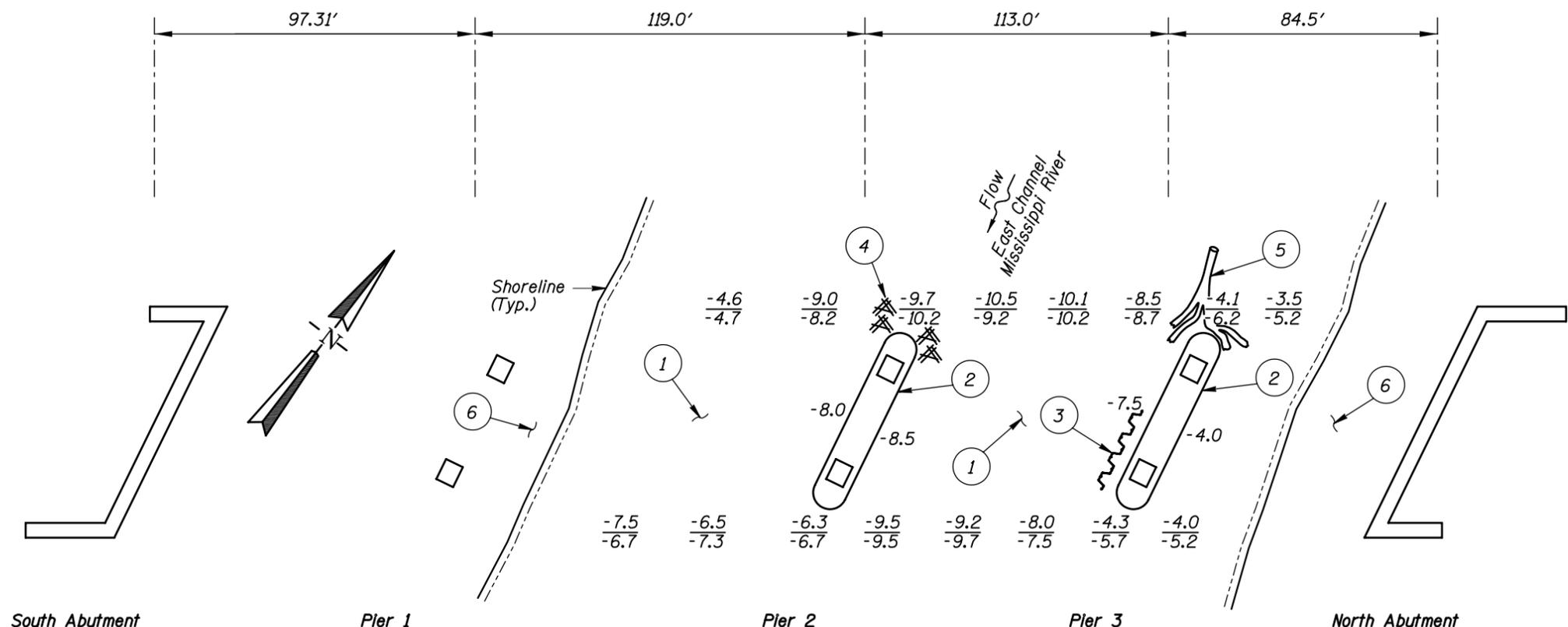
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/09/02

Item 113: Scour Critical Bridges: Code R/02

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

\_\_\_\_\_ Yes  X  No



**SOUNDING PLAN**

**GENERAL NOTES:**

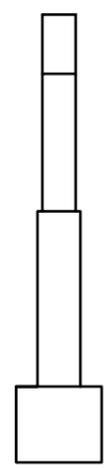
1. Piers 2 and 3 were inspected underwater.
2. At the time of inspection on September 29, 2002 the waterline was located approximately 3.0 feet below the benchmark reference at Elevation 802.5 on Pier 3. Based on the reference this corresponds with a waterline elevation of 799.1.
3. Soundings indicate 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.

**INSPECTION NOTES:**

- ① The channel bottom consisted of silty sand and scattered cobbles with up to 1 foot of probe rod penetration.
- ② The concrete piers exhibited light scaling from 1 foot above to 1 foot below the waterline.
- ③ Steel sheet piling was observed along the south face of Pier 3 from the upstream quarter point to the downstream nose and extended 1 foot above the channel bottom.
- ④ A light accumulation of timber debris was observed at the upstream end of Pier 2 on the channel bottom.
- ⑤ A moderate accumulation of timber debris, including a 20-foot-long log that was 1 foot in diameter, was observed at the upstream end of Pier 3.
- ⑥ Both embankments were well armored with grouted riprap.

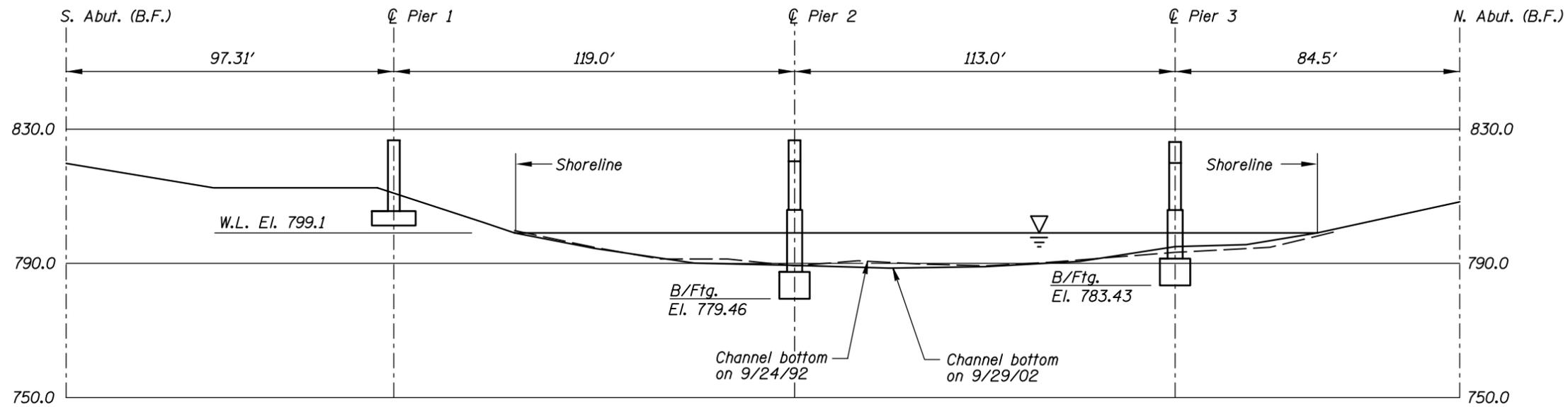
**Legend**

- 3.0 Sounding Depth from Waterline (9/29/02)
- 2.2 Sounding Depth from Waterline (9/24/92)
- Timber Debris

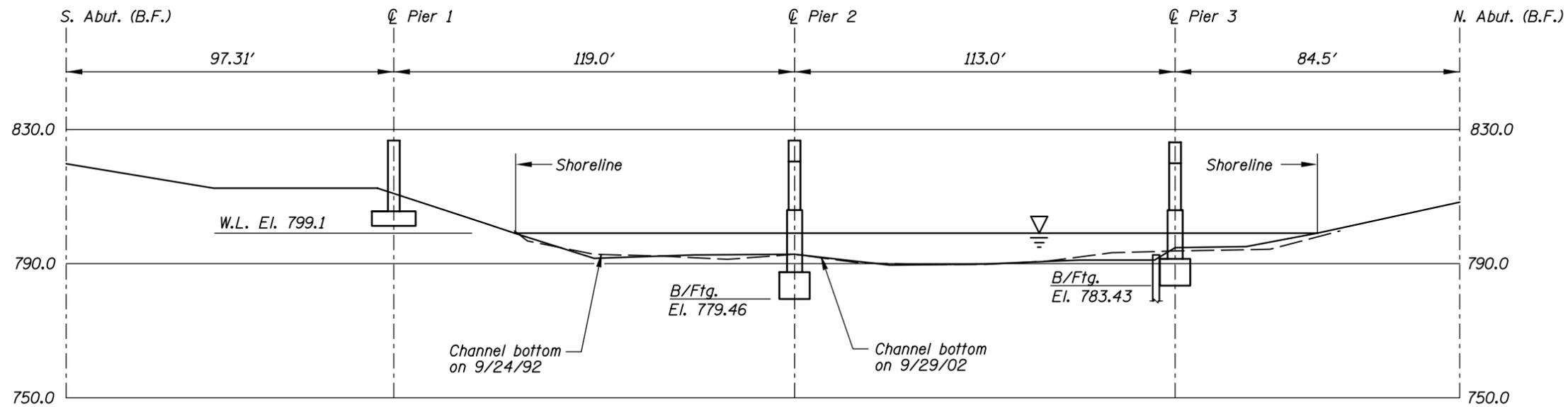


**TYPICAL END VIEW OF PIERS**

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 27537 OVER THE EAST CHANNEL OF THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS, INC.</b>	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35I20I18		Figure No.: 1



**UPSTREAM FASCIA PROFILE**



**DOWNSTREAM FASCIA PROFILE**

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 27537 OVER THE EAST CHANNEL OF THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: PRH	 <b>COLLINS ENGINEERS, INC.</b> 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: SEPT. 2002
Checked By: MDK		Scale: 1"=40'
Code: 3512018		Figure No.: 2



Photograph 1. Overall View of Structure, Looking East.



Photograph 2. View of Pier 2, Looking North.



Photograph 3. View of Pier 3, Looking North.

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

INSPECTORS: Collins Engineers, Inc. DATE: September 29, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 27537 WEATHER: Overcast, " 55E F

WATERWAY CROSSED: The East Channel of the Mississippi River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR  
OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins

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

TIME IN WATER: 11:50 a.m.

TIME OUT OF WATER: 12:25 p.m.

WATERWAY DATA: VELOCITY Negligible / None

VISIBILITY " 1 foot

DEPTH 9.7 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 2 and 3

REMARKS: Overall, the concrete of the piers was in good condition with only light scaling observed near the waterline. Light to moderate accumulations of timber debris were observed at the upstream ends of both Piers 2 and 3. Steel sheet piling extended 1 foot above the channel bottom along Pier 3 from the upstream quarter point to the downstream nose of the pier.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES  X  NO

Monitor the timber debris at Piers 2 and 3, and if found to be increasing in the future, removal operation may become warranted.

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. 27537  
 INSPECTORS Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Shirley M. Walker, P.E.  
 WATERWAY CROSSED The East Channel of the Mississippi River

INSPECTION DATE September 29, 2002  
 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					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Pier 2	9.7'	N	7	N	9	N	7	7	N	8	7	7	7	N	N	N	N	N
	Pier 3	7.5'	N	7	N	9	N	7	7	N	8	6	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was in good condition with only light scaling observed near the waterline. Light to moderate accumulations of timber debris were observed at the upstream ends of both Piers 2 and 3. Steel sheet piling extended 1 foot above the channel bottom along Pier 3 from the upstream quarter point to the downstream nose of the pier.

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.