



**F. Concrete Company  
Fayden Plant  
Lancaster, OH**

**D13 Duct  
Inspection Report  
April 2024**



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August 2, 2024

J. Pepperoni  
Maintenance Planner

Subject: D13 Duct Inspection

Mr. Pepperoni,

Thank you for your assistance during the performance of this project. Included you will find the Inspection Report containing labeled photographs, findings, and recommendations for the maintenance of your D13 Duct.

It was a pleasure to work with you on this project. If you need any further assistance, please do not hesitate to contact us. We will be glad to answer any questions you may have and to provide assistance with any or all of the repairs that are recommended.

Sincerely,

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## Executive Summary

F. Concrete Company retained Industrial Access, Inc. (hereafter referred to as “IA”) to conduct a condition assessment inspection to the D13 Duct at the Fayden Plant in Lancaster, OH.

Activities included reviewing pertinent documents, photographing anomalies, and an examination of the exterior and interior of the duct.

An evaluation was performed of the significance of any detected degradation, deterioration, malfunction or damage to the duct and any associated appurtenances.

The duct appears to be in **POOR** condition. There are some issues that should be corrected and some preventative measures that should be taken to prolong the life of the duct. These items have been listed below:

- **Replace the failed cladding around the ladder access door**
- **Patch the holes in the duct**
- **Reinforce the buckled section of the duct**
- **Unclog the pipes within the pantlegs of the duct**
- **Remove and replace the damaged, torn, and peeling cladding panels on the inside of the duct**
- **Hydro-wash the interior and exterior of the duct to remove the buildup**
- **Tool-clean the oxidation on the interior and exterior of the duct**

Please refer to the [Recommendations](#) section of this report for a complete list of maintenance and repair items to maximize potential service life of the structure.

## Introduction

In accordance with the client's purchase order number F066777-0000-000, Industrial Access, Inc. performed a "Class II" condition assessment inspection in compliance with ASCE "Chimney and Stack Inspection Guidelines" of the D13 Duct at Lancaster, OH.

Activities included reviewing pertinent documents, photographing anomalies, and an examination of the exterior and interior of the duct.

An evaluation was performed of the significance of any detected degradation, deterioration, malfunction or damage to the duct and any associated appurtenances.

Based on the inspection findings, recommendations for maintenance and repairs are mentioned and assigned a corrective action factor, as explained in the [Recommendations](#) section.

Members of the Industrial Access Inspection Site Team were:

|               |                       |
|---------------|-----------------------|
| J. How        | Project Manager       |
| A. Buge       | Asst. Project Manager |
| C. Hillian    | Technician            |
| B. Verdin     | Technician            |
| R. Prowley    | Technician            |
| Rick Scantro  | Technician            |
| John Smith    | Technician            |
| B. Coy        | Technician            |
| P. Reyna      | Technician            |
| Jo Sta        | Technician            |
| Brendon Purch | Technician            |
| Lex Diaz      | Technician            |

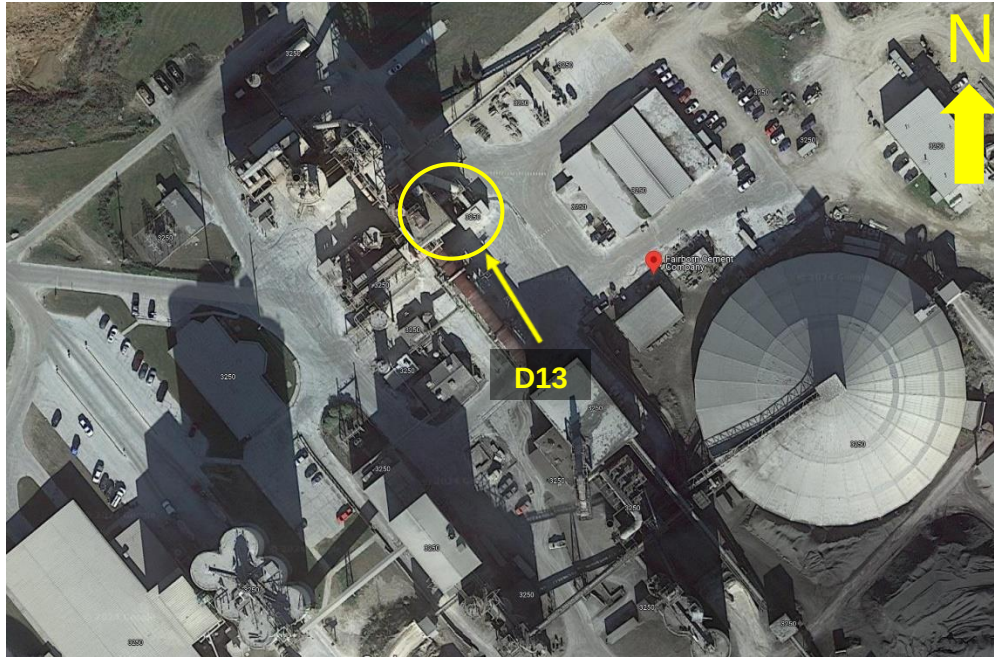
This report presents our observations together with our findings, photographs, and rehabilitation recommendations.

## Structure Description

### Chimney Description:

**Construction:** Duct; Steel

**Access Door** Access door at the vent blades and by ladder



Location of Duct

## Inspection Procedures

Upon arrival of our crew and equipment to the job site, safety devices, all in accordance with prevailing safety regulations, were installed to carry out the work.

The exterior of the duct was visually inspected using a digital camera from the ground and nearby vantage points.

The interior of the duct was inspected using rope access techniques. A visual inspection was performed using photographs and UT readings taken at 10'± intervals at all 4 quadrants when accessible. All anomalies discovered during the inspection were documented.

After the inspection was completed, our crew removed all our debris from the area and disposed of the remains at an authorized dumpsite, leaving the site in an “As Found” or better condition.



## Exterior Liner Inspection

The exterior of the duct was visually inspected using a digital camera from the ground and nearby vantage points. Detailed results can be found in [Findings](#) section of this report. The following sample photographs document the exterior of the structure.

### Exterior



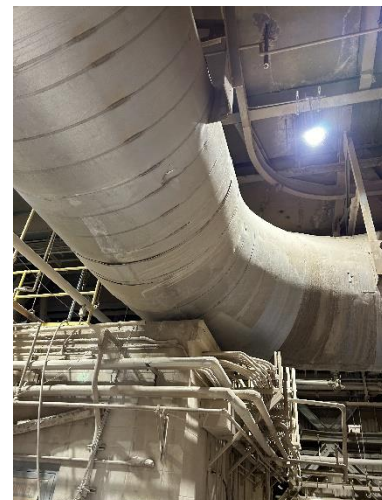
EXT 1 – Buildup on the outside sections of duct; oxidation on expansion joint.



EXT 2 – Oxidation present behind torn fabric and damaged cladding

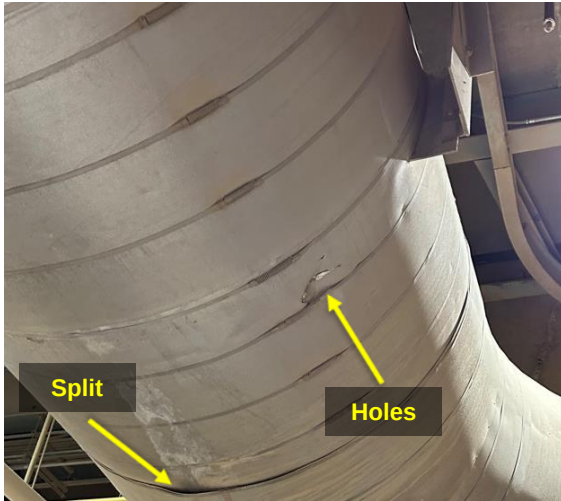


EXT 3 – Missing bolt on expansion joint



EXT 4 – Several holes in duct and cladding is falling apart

## Exterior (continued)



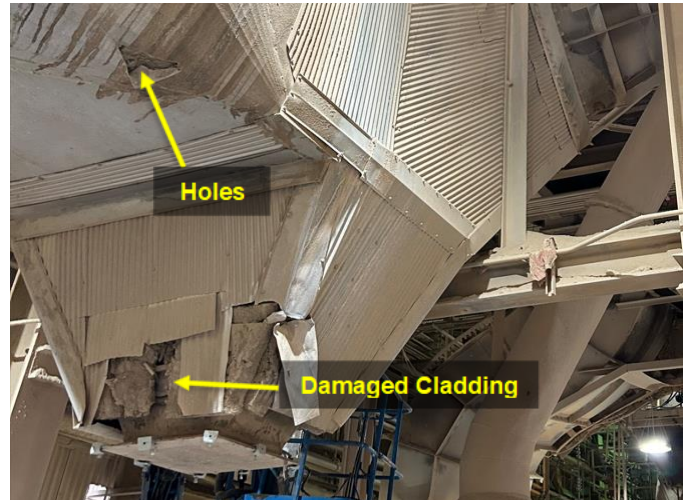
EXT 5 – Split in cladding at the bottom and hole is present



EXT 6 – Holes in the duct



EXT 7 – General view



EXT 8 – Holes in duct and cladding is falling apart



EXT 9 – Damaged cladding



EXT 10 – Access door to the duct

## Exterior (continued)



EXT 11 – Light buildup on top of duct



EXT 12 – Access door to the duct



EXT 13 – Light buildup on top of duct



EXT 14 – Underside of the duct



EXT 15 – Light buildup present



EXT 16 – Oxidation present

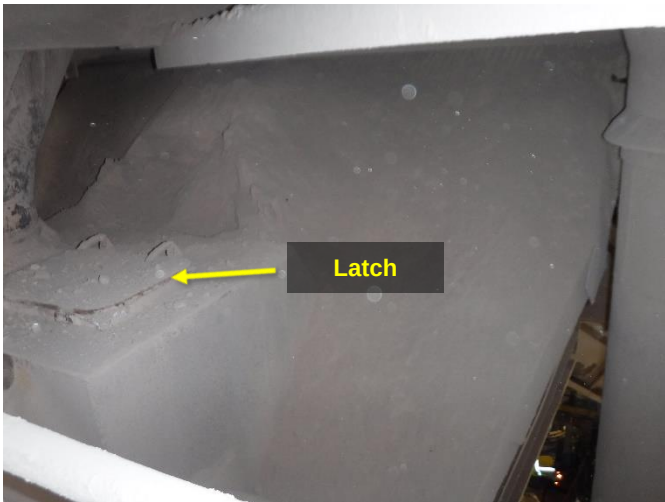
## Exterior (continued)



EXT 17 – Heavy oxidation



EXT 18 – Debris and buildup on duct



EXT 19 – Oxidation around the latch and buildup present



EXT 20 – East and west pantleg



EXT 21 – Side of the east pant leg; oxidation on access door

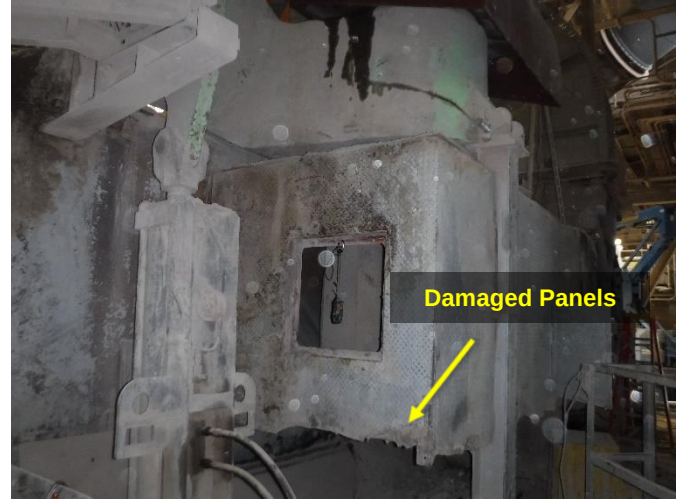


EXT 22 – Oxidation on door

## Exterior (continued)



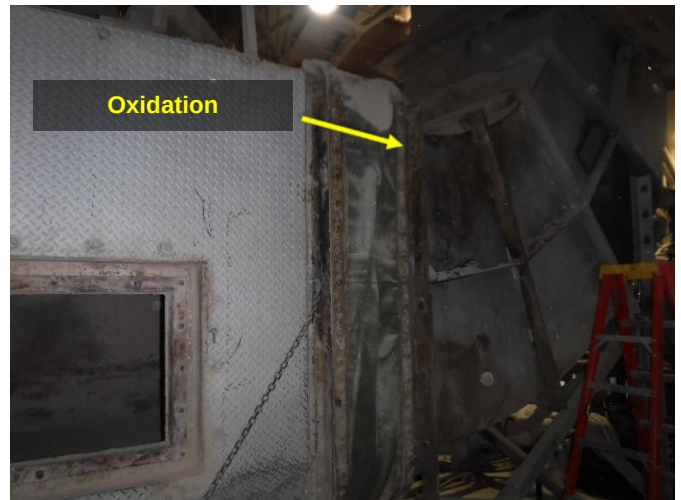
EXT 23 – Oxidation on the access door at the end of the east pant leg



EXT 24 – Damaged panels



EXT 25 – Oxidation on the access door on the west pant leg



EXT 26 – Severe oxidation on the expansion joint and closest stiffener of the west pant leg



EXT 27 – Oxidation present on vent

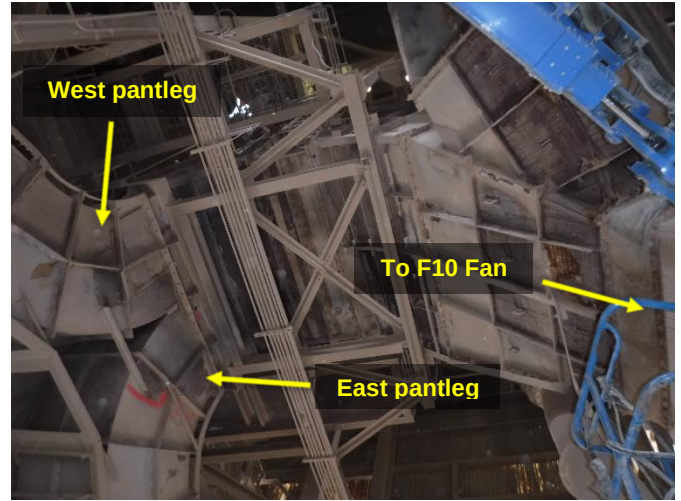


EXT 28 – Mild to severe oxidation on the side of the west pant

## Exterior (continued)



EXT 29 – Duct pant leg



EXT 30 – Underside of duct

## Interior Inspection

The interior of the duct was inspected using rope access techniques. A visual inspection was performed using photographs and UT readings taken at 10'± intervals at all 4 quadrants when accessible. All anomalies discovered during the inspection were documented. Results are discussed in [Findings](#) section. These photographs are meant to document the current condition of the interior of the structure.

### D13 Duct to F10 Fan



INT 1 – Access door leading to F10 fan



INT 2 – Opening to duct



INT 3 – Damper blades



INT 4 – Damper blades

## D13 Duct to F10 Fan (Continued)



INT 5 – Damper blades



INT 6 – Damper blades



INT 7 – Buildup on damper blades



INT 8 – Previous patchwork



INT 9 – View of duct



INT 10 – Corner of damper blades

## D13 Duct to F10 Fan (Continued)



INT 11 – Buildup on damper blades



INT 12 – Buckling in the corner of duct



INT 13 – Buckling in the corner of duct



INT 14 – 13"± – 0.5" hole present in the east side of the duct



INT 15 – 13"± – 1.5" hole present in the east side of the duct



INT 16 – 13"± – 1.5" hole present in the east side of the duct

## D13 Duct to F10 Fan (Continued)



INT 17 – 11'± – The metal panel is torn on the floor of the West side



INT 18 – 11'± – The metal panel is torn on the floor of the West side



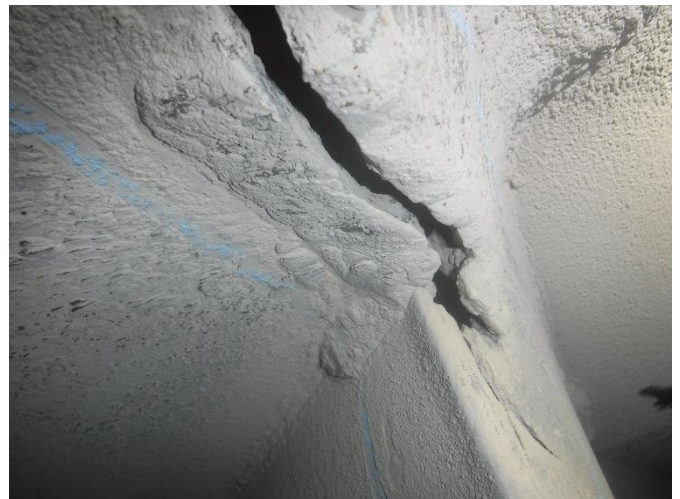
INT 19 – 11'± – The metal panel is torn on the floor of the West side



INT 20 – 11'± – The metal panel is torn on the floor of the West side



INT 21 – 11'± – The metal panel is torn on the floor of the West side



INT 22 – 11'± – The metal panel is torn on the floor of the West side

## D13 Duct to F10 Fan (Continued)



INT 23 – 16'± – The ceiling of the duct is damaged



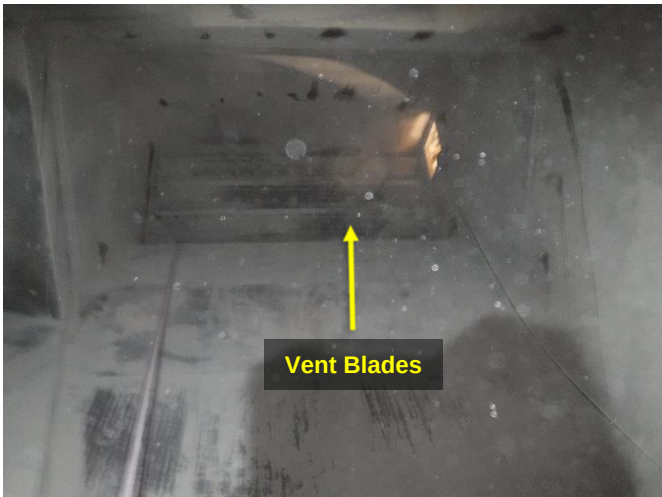
INT 24 – 16'± – The ceiling of the duct is damaged



INT 25 – 20'± – View of duct wall



INT 26 – 20'± – Oxidation present behind buildup



INT 27 – 20'± – View looking up at the damper blades



INT 28 – 16'± – The top West side of the duct is split

## D13 Duct to F10 Fan (Continued)



INT 29 – Ladder in the opening below the duct



INT 30 – Looking forward duct; Debris and buildup present on duct floor



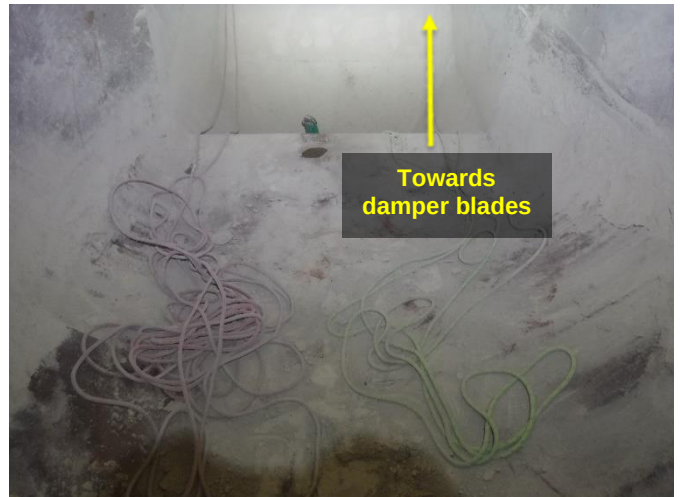
INT 31 – Looking forward towards f10 fan



INT 32 – Heavy buildup and debris



INT 33 – Heavy buildup and debris



INT 34 – Looking back towards damper blades

## D13 Duct to F10 Fan (Continued)



INT 35 – Looking back towards damper blades



INT 36 – Looking back towards damper blades



INT 37 – Looking through duct



INT 38 – Heavy debris and buildup



INT 39 – Duct curling downward



INT 40 – Duct curling downward

**D13 Duct to F10 Fan (Continued)**



INT 41 – Duct curling down outside of the building going to fan



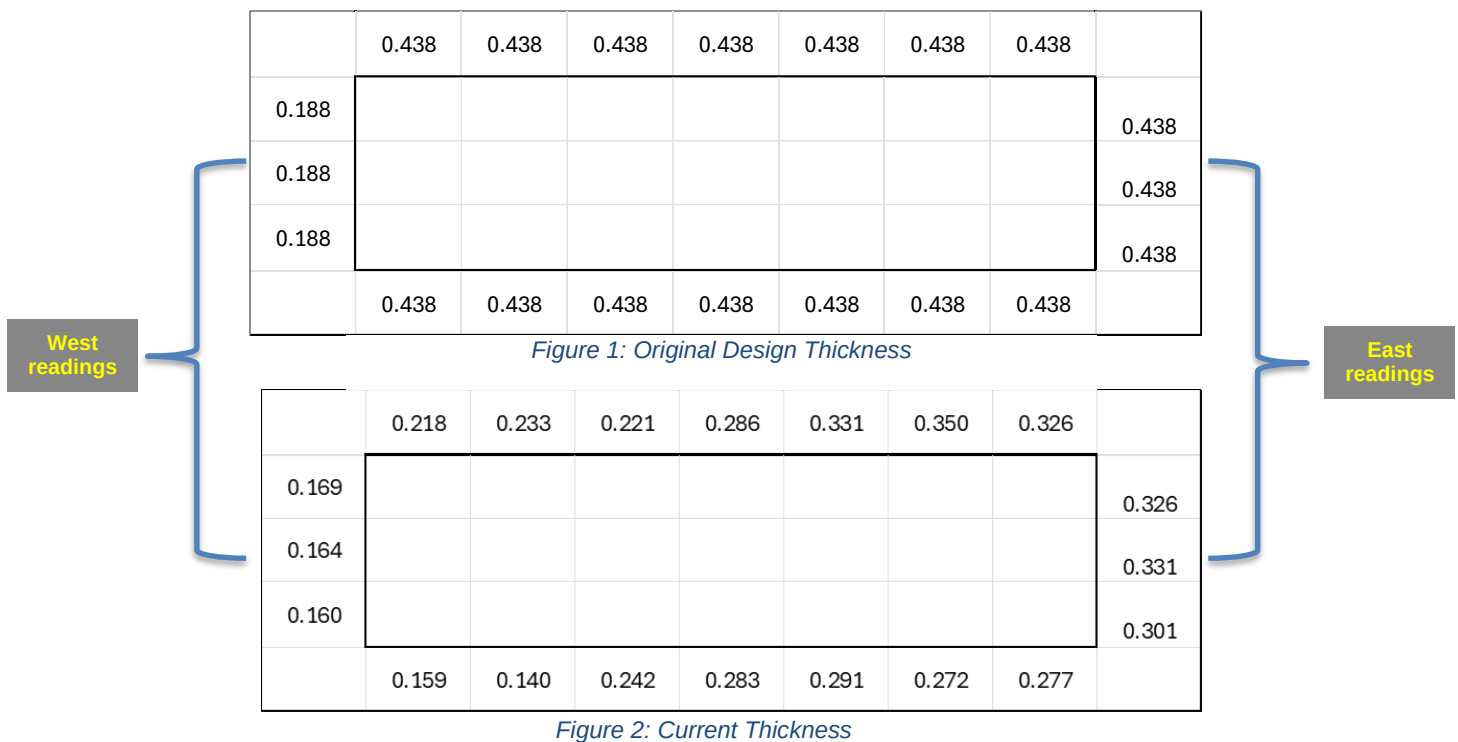
INT 42 – Duct curling down outside of the building going to fan

## Interior – UT Readings: Damper Baldes to F10 Fan

UT readings were taken inside the duct at 10-foot intervals from the damper blades to the F10 fan. The data below reflects a comparison between the original design thickness of the duct's steel and its current thickness, including details of the side, depth (ft), and corresponding readings. A more comprehensive evaluation of the results are available in the [Findings](#) section of the document.

**\*Note:** The original thickness of the duct was 0.188 inches. However, in certain areas, the thickness measures 0.438 inches. This increased thickness indicates the presence of reinforcement patch plates that were previously installed to strengthen the steel in those sections. When evaluating the current thickness readings, any measurements below 0.188 inches (in unreinforced areas) or 0.438 inches (in areas with reinforcement) indicate a loss of material. The presence of these patch plates should be considered when assessing the condition and remaining thickness of the duct.

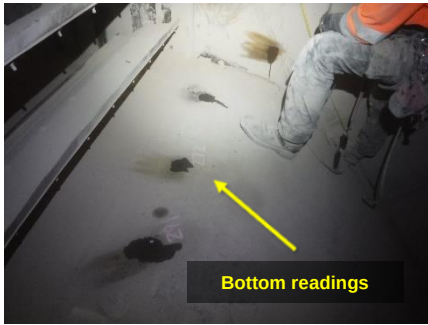
### Interior UT Readings: at Damper Blades



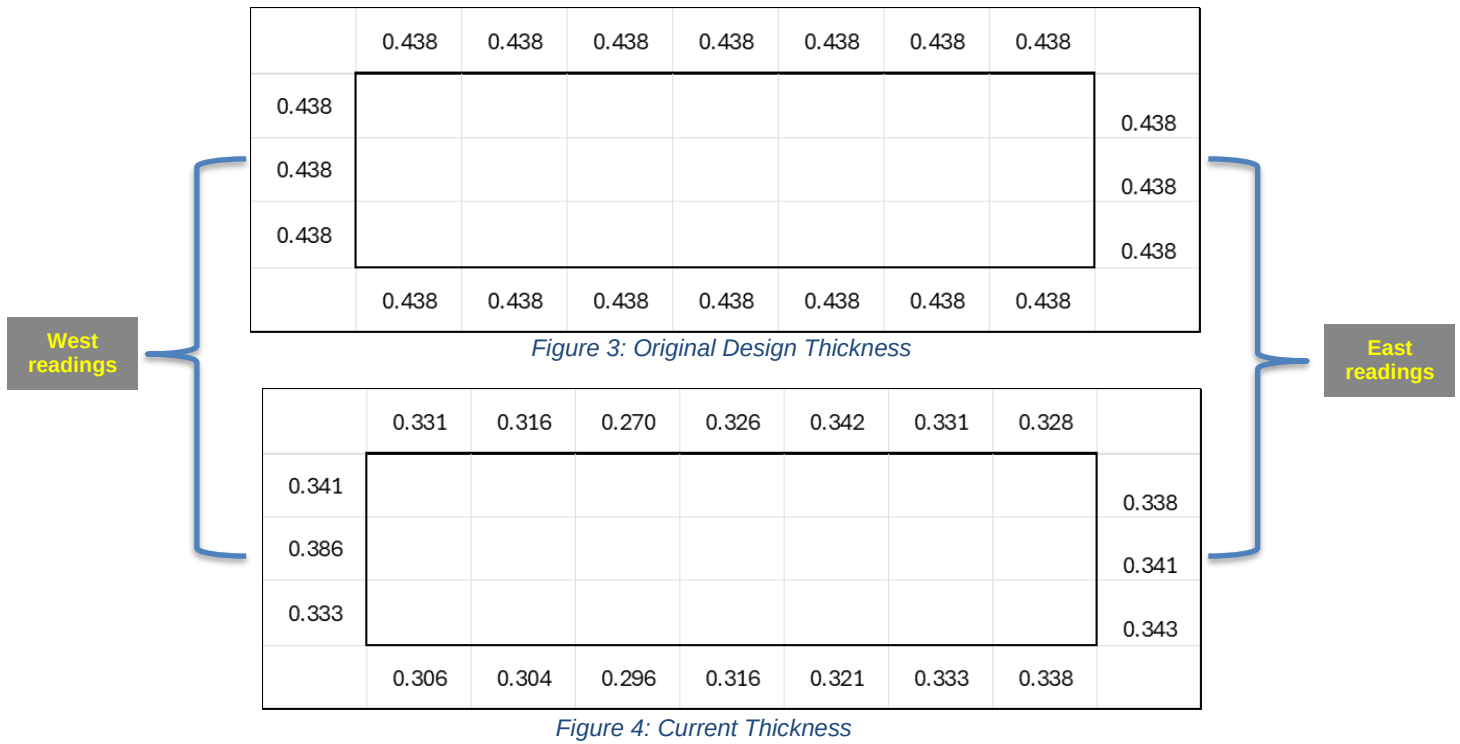
| Location | Original Thickness (in) | Current Thickness (in) | Percentage Loss (%) |
|----------|-------------------------|------------------------|---------------------|
| Top      | 0.438                   | 0.218 - 0.350          | 20.09% - 50.73%     |
| West     | 0.188                   | 0.160 – 0.169          | 10.11% - 14.89%     |
| Bottom   | 0.438                   | 0.140 – 0.291          | 20.09% - 50.73%     |
| East     | 0.438                   | 0.301 – 0.331          | 20.09% - 50.73%     |

Table 1: Percentage Loss

**Interior UT Readings: at Damper Blades (Photo Documentation)**



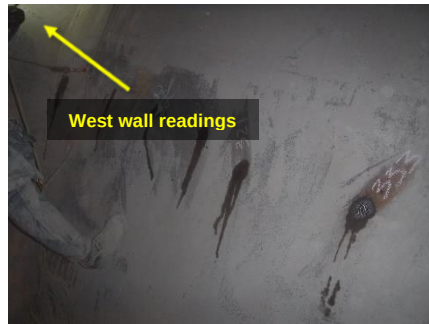
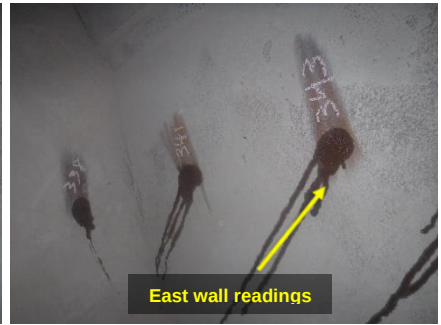
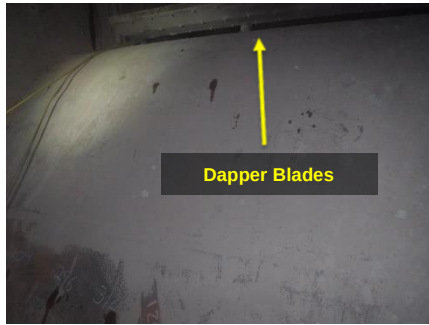
## Interior UT Readings: 10ft from Damper Blades



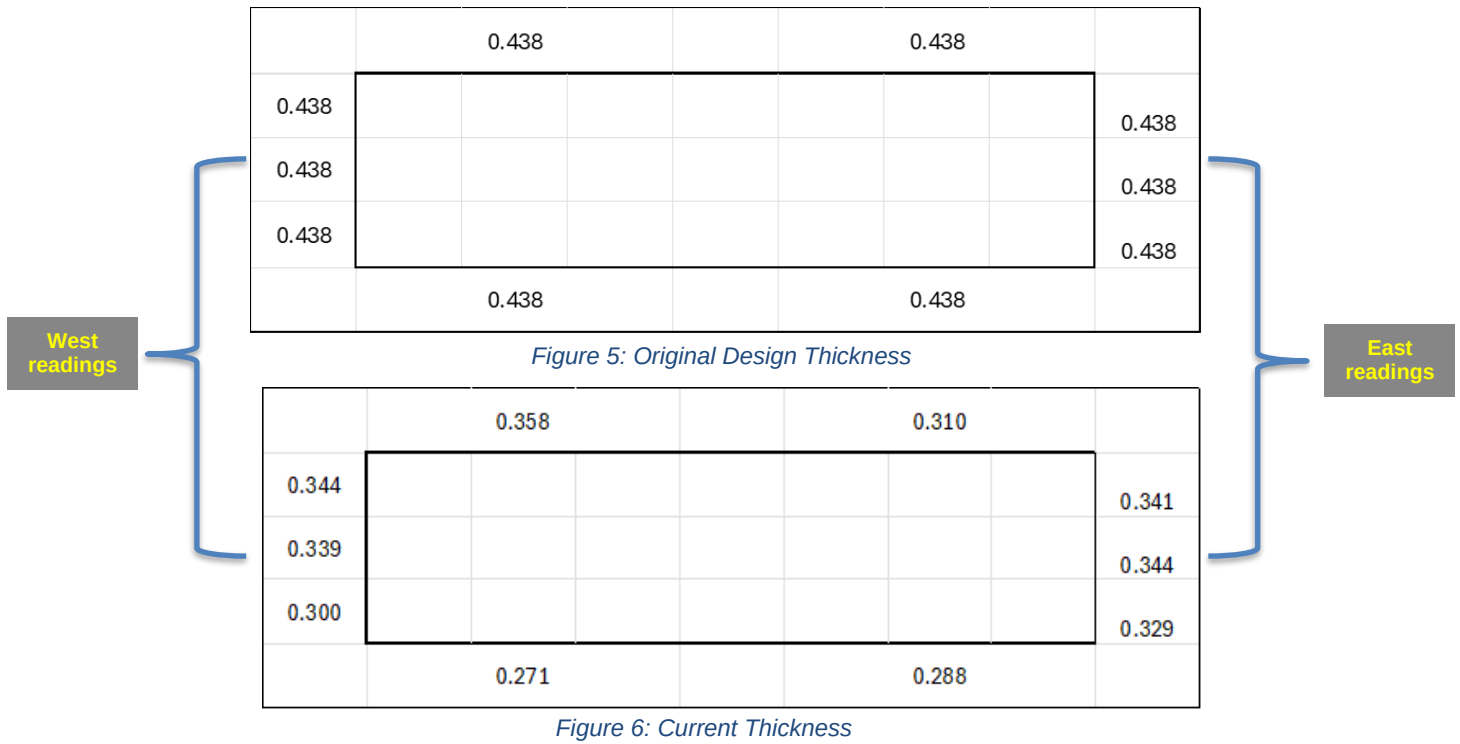
| Location | Original Thickness (in) | Current Thickness (in) | Percentage Loss (%) |
|----------|-------------------------|------------------------|---------------------|
| Top      | 0.438                   | 0.270 - 0.342          | 21.92% - 38.36%     |
| West     | 0.438                   | 0.333 – 0.386          | 11.87% - 23.97%     |
| Bottom   | 0.438                   | 0.296 – 0.338          | 22.83% - 32.42%     |
| East     | 0.438                   | 0.338 – 0.343          | 21.69% - 22.83%     |

Table 2: Percentage Loss

**Interior UT Readings: 10ft from Damper Blades (Photo Documentation)**



## Interior UT Readings: 20ft from Damper Blades



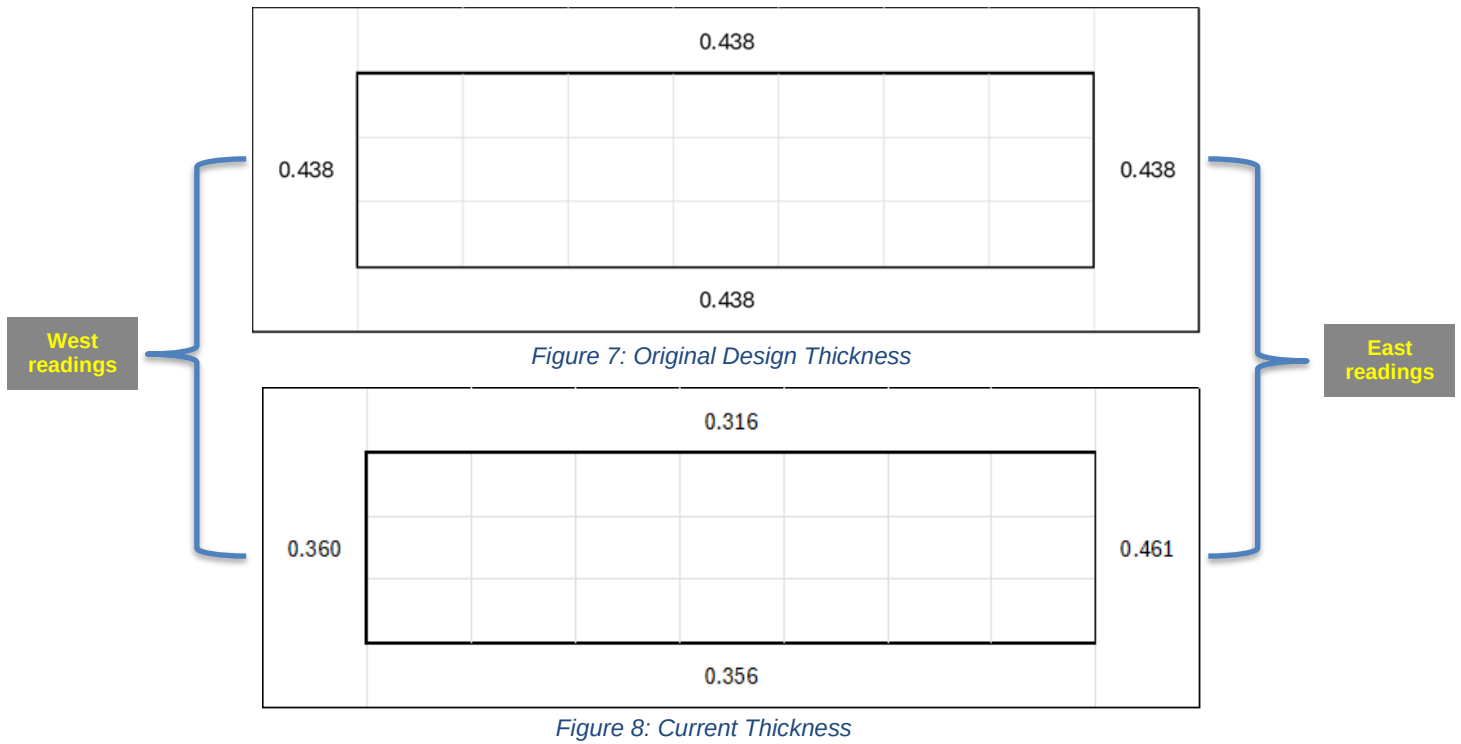
| Location | Original Thickness (in) | Current Thickness (in) | Percentage Loss (%) |
|----------|-------------------------|------------------------|---------------------|
| Top      | 0.438                   | 0.310 - 0.358          | 18.26% - 29.22%     |
| West     | 0.438                   | 0.300 – 0.344          | 21.46% - 31.51%     |
| Bottom   | 0.438                   | 0.271 – 0.288          | 34.25% - 38.13%     |
| East     | 0.438                   | 0.329 – 0.344          | 21.46% - 24.89%     |

Table 3: Percentage Loss

**Interior UT Readings: 20ft from Damper Blades (Photo Documentation)**



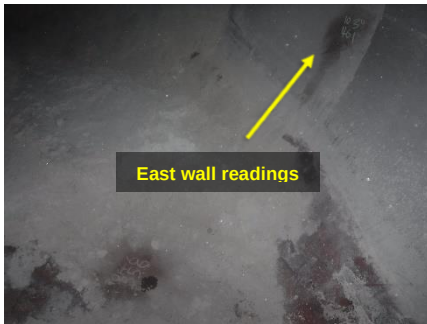
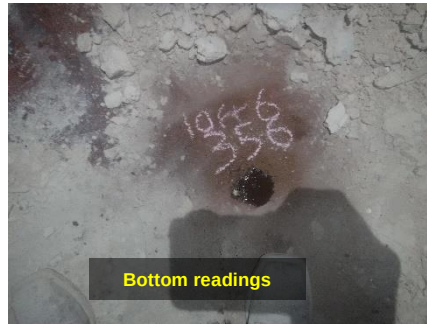
**Interior UT Readings: 10ft from Bottom Access Door**



| Location | Original Thickness (in) | Current Thickness (in) | Percentage Loss (%) |
|----------|-------------------------|------------------------|---------------------|
| Top      | 0.438                   | 0.316                  | 27.85%              |
| West     | 0.438                   | 0.360                  | 17.81%              |
| Bottom   | 0.438                   | 0.356                  | 18.72%              |
| East     | 0.438                   | 0.461                  | (+) 5.25%           |

*Table 4: Percentage Loss*

**Interior UT Readings: 10ft from Bottom Access Door (Photo Documentation)**



## Findings

This section provides a comprehensive overview of the findings discovered during the initial inspection, offering a detailed layout of the identified issues and a general evaluation of the structure.

### Exterior Findings

#### Exterior

1. Light buildup is present on the exterior of the duct, both indoors and outdoors (EXT 11, 12, 13, 18, & 19)
2. Mild oxidation is present on most of the exterior (EXT 1, 2, 16, 17, 21, 22, 23, 25, 26, 27, & 28).
3. The expansion joints are severely oxidized. This should be addressed to prevent further deterioration (EXT 26, 27). In the expansion joint outside, there is a missing bolt (EXT 3).
4. Several holes were discovered in the cladding which may allow flue gas to leak (EXT 5, 6, & 8).
5. The cladding was found to be damaged in some areas, notably around the ladder access opening. This can lead to flue gas leaks (EXT 1, 5, 8, 9, & 30)

### Interior Findings

#### Interior –

1. Moderate to heavy buildup is present throughout the interior of the duct (INT 2, 3, 4, 7 9, 10, 38, 41, 51,123, & 139).
2. Several holes were discovered in the cladding, allowing light into the duct (INT 14, 15, 16, 57, 58, 63, 64, & 70, 71, 139, 140, & 145).
3. A buckle was found in the corner of the duct (INT 12 & 13).
4. At several locations in the duct, panels were damaged, torn, or peeling away from the rest of the duct (INT 17, 18, 19, 20, 21, 22, 23, 24, 28,91, 92, 93, 94, 95, 96, 97, 128, 129, 130, & 134).
5. The pipes within the pantlegs are clogged (INT 105, 106, 143, & 144).
6. Inside the horizontals section of the pantlegs, trash and debris are scattered around the duct (INT 151 & 152).

## Recommendations

Based on the inspection findings, the following recommendations for maintenance and repair of the duct are submitted.

|     |                                                                                                                                                                                                                                                                                                         |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1A- | Immediate concern or significant structural deficiency with imminent potential for loss of life or personal injury.                                                                                                                                                                                     |
| 1B- | Immediate safety concern or significant structural or non-structural deficiency with future potential for loss of life or personal injury.                                                                                                                                                              |
| 1C- | Immediate concern or significant structural or non-structural deficiency which does not pose imminent potential for loss of life or structural collapse, but whose condition should either be corrected in the near future or be closely monitored in the future for evidence of further deterioration. |
| 2A- | An examination scheduled as per the procedure guideline or sooner based on recommendations made by plant observations or examinations.                                                                                                                                                                  |
| 2B- | Moderate structural or non-structural deficiency which does not pose imminent potential for loss of life or structural collapse, but whose condition should either be corrected in the near future or be closely monitored in the future for evidence of further deterioration.                         |
| 3A- | Minor structural or non-structural deficiency, which does not pose any threat to loss of life or structural integrity. Functional deficiency, which may affect the structure's performance.                                                                                                             |
| 3B- | Non-structural deficiency, which does not pose any threat to loss of life or structural integrity. Repairs are intended for better appearance.                                                                                                                                                          |

**(1C) Replace the failed cladding around the ladder access door**

The cladding around the ladder access door has failed and is exposing the interior of the duct to the room. This should be repaired to prevent flue gas leaks within a confined space, which poses a hazard to workers.

**(1C) Patch the holes in the duct**

The holes in the duct should be patched to prevent flue gas leaks within the confined space of the building.

**(1C) Reinforce the buckled section of the duct**

Exterior reinforcement should be installed around the buckled section within the duct to facilitate the structural integrity of the section.

**(2B) Unclog the pipes within the pantlegs of the duct**

The heavy buildup discovered within the duct pipes should be removed and the pipe unclogged to restore functionality

## Recommendations (continued)

(2B) **Remove and replace the damaged, torn, or peeling cladding panels on the inside of the duct**

The damaged, torn, and peeling cladding panels within the duct should be removed and replaced with new panels. The current damaged allows for intrusive buildup, oxidation, and corrosion., so replacing the panels is essential to extend the duct's service life.

(2B) **Hydro-wash the interior and exterior of the duct to remove the buildup.**

The interior and exterior of the duct should be hydro washed to remove the accumulated buildup. This will prevent deterioration due to corrosive buildup.

(2B) **Tool-clean the oxidation on the interior and exterior of the duct**

The interior and exterior of the duct should be hydro washed to remove the accumulated buildup. This will prevent deterioration due to corrosive buildup.