

# ATTACHMENT B

LSBS II WELDING EMISSIONS MEMO



## MEMORANDUM

To: Kenzie Billings

Date: December 14, 2021

From: Brian Eagle

Project No.: 8006.58.01

RE: PCC Structurals LSBS II Welding Emissions

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PCC Structurals, Inc. (PCC) received a letter dated October 19, 2021, from the Oregon Department of Environmental Quality (DEQ) relating to the Cleaner Air Oregon Large Parts Campus (LPC) Emissions Inventory that PCC submitted on October 10, 2020. The LSBS II facility is one of the LPC collocated facilities and is located at 9169 SE 67th Avenue, Portland, Oregon. Activities performed at LSBS II include grinding, welding, sandblasting, and various inspection processes. The DEQ requested that PCC provide support for the following Emissions Inventory statement: “the building contains minimal venting aside from venting to the baghouses. 75% of welding emissions routed to the baghouses is based on observation of the process, and the most likely airflow is through baghouses.”

Maul Foster & Alongi, Inc. (MFA) visited LSBS II on November 10, 2021, during normal operating hours. During the visit, MFA confirmed that the building is negatively pressurized (i.e., air flows into the building at all entrances), reviewed the potential routing of emissions from welding activities, and evaluated the sources of fresh air supplied to the building. Our observations and conclusions are summarized below.

### AIR FLOW ANALYSIS

During the November 10, 2021, visit, MFA conducted an air flow analysis (also referred to as a “smoke test”) at each building opening and at each location noted on the attached figure. The purpose of the analysis was to confirm that the baghouses maintain a negative pressure inside the building, as outside air is drawn inward through all building entries to make up for the air exhausted by the baghouses.

LSBS II has five bay doors on the south side. The easternmost door is sometimes held open for movement of parts and personnel while the others typically remain closed and are opened only as needed for operational purposes. At the time of the visit, both the easternmost and westernmost bay doors were open while smoke tests were conducted at each location. Standing immediately outside building entrances, MFA personnel used Sensidyne No. 5100 Smoke Tubes and a rubber aspirator bulb to produce puffs of smoke. The behavior of the smoke plume was observed while these two bay doors were open. Smoke was released outdoors adjacent to the edges and the center of each bay

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doorway. At each location, the smoke was clearly pulled into the building, confirming that a negative pressure is maintained inside the building and outside air is drawn inwards at these openings.

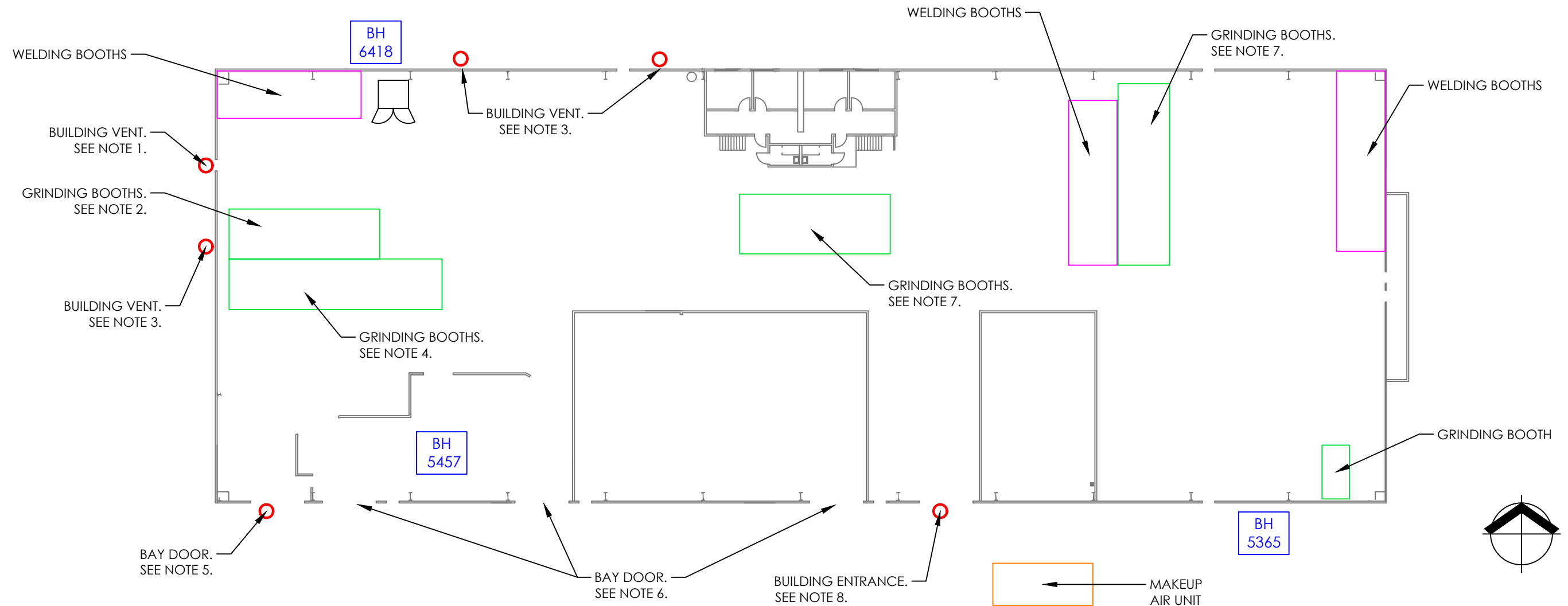
MFA conducted additional smoke tests at area vents located on the exterior walls of the building. At the first vent, located approximately 8 feet from the ground, the movement of the smoke was consistent with observations at the building entrances and confirmed the movement of air into the building. Three additional vents, equipped with axial fans, are located on the exterior walls of the building, at a higher elevation than the other. The fans were not in operation during the visit. MFA conducted smoke tests approximately 3 feet below these vents and discerned no influence of the vent on the smoke released, although the smoke generally dissipated before reaching the vent face. While not a confirmation of the direction of the airflow through the vent, this does indicate that these vents are not a point of air being exhausted from the building. It is important to note that no exhaust vents are installed in the roof.

## **BUILDING AIR SUPPLY AND VENTILATION CONFIGURATION**

MFA personnel assessed the general ventilation configuration of LSBS II. A large air supply unit located on the south side of the building supplies filtered outside air to the building. Filtered outside air is supplied directly to the grinding booths located in the southwest quadrant of the building, and grinding emissions are routed directly to Baghouse 5365. Filtered outside air is delivered to the general area of all other grinding booths but is not directly supplied as with the southwest booths. These other grinding booths are equipped with filter banks that draw general building air into the booths. Both welding and grinding activities are conducted in the northwest and northeast quadrants of the building. The welding stations have no direct points exhausting to the exterior of the building. The only locations where air is vented out of the building is through the grinding booths, which exhaust to either Baghouse 5365 or Baghouse 6418. Therefore, the most direct route for the welding emissions to reach atmosphere is by being drawn through the grinding booths and venting to the baghouses. The approximate locations of welding and grinding booths are shown on the figure.

## **CONCLUSIONS**

LSBS II is maintained under negative pressure by the operation of the baghouses, which provide the primary ventilation for the building, even with a large air supply unit delivering filtered outside air into the building. This negative pressure and the absence of reasonable alternative routes for air to leave the building demonstrate that any emissions released inside LSBS II, such as welding fumes, are likely to be controlled by the baghouses. It is a reasonable assumption that the facility exhausts indoor air to atmosphere only through a baghouse. Therefore, it is conservative to assume that only 75 percent of all welding emissions at LSBS II are controlled by the baghouse.



NOTES:

1. SMOKE TEST CONDUCTED ON 11/10/2021 SHOWED AIR MOVEMENT INTO BUILDING FROM THE OUTSIDE.
2. AIR INLET TO THE GRINDING BOOTHS IS THROUGH PLENUM ON TOP OF THE BOOTH, WHICH PULLS IN PLANT AIR. FRESH AIR MAKEUP IS DELIVERED TO THE GENERAL AREA IN FRONT OF THE BOOTHS, WHICH MIXES WITH PLANT AIR. BOOTHS VENT TO BH 6418.
3. VENT. NO FAN RUNNING.
4. FRESH AIR IS SUPPLIED DIRECTLY TO THE FRONT OF EACH GRINDING BOOTH, AND IT IS ASSUMED THAT THE BOOTHS DRAW MINIMAL PLANT AIR. BOOTHS VENT TO BH 5365.
5. BAY DOOR OPEN DURING VISIT, BUT TYPICALLY CLOSED DURING NORMAL OPERATIONS. SMOKE TEST CONDUCTED ON 11/10/2021 SHOWED AIR MOVEMENT INTO BUILDING FROM THE OUTSIDE.
6. BAY DOOR CLOSED ON 11/10/2021. NO SMOKE TEST CONDUCTED.
7. AIR INLET TO THE GRINDING BOOTHS IS THROUGH PLENUM ON TOP OF THE BOOTH, WHICH PULLS IN PLANT AIR. FRESH AIR MAKEUP IS DELIVERED TO THE GENERAL AREA IN FRONT OF THE BOOTHS, WHICH MIXES WITH PLANT AIR. BOOTHS VENT TO BH 5365.
8. BAY DOOR AT BUILDING ENTRANCE WAS KEPT OPEN DURING THE SMOKE TEST CONDUCTED ON 11/10/2021. THE SMOKE TEST SHOWED AIR MOVEMENT INTO THE BUILDING FROM THE OUTSIDE.

LEGEND:

- LOCATION OF SMOKE TEST
- BAGHOUSE
- BH BAGHOUSE



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This figure prepared as supplemental visual information only and should not be used for construction purposes. Only plan sheets approved, stamped and signed by a registered professional engineer in the state of governing jurisdiction shall be used for construction. Additionally, only plans approved by the applicable governing jurisdiction(s) shall be used for final construction unless otherwise expressly noted in writing by the engineer of record.

**Figure**  
**LSBS II Welding Notes**  
PCC Structurals - Large Parts Campus  
Milwaukie, Oregon