

Field Report

Project: CSX Curtis Bay Coal Pier Investigation

Date: 01/06/2022

Report Type: Inspection Report - South Tunnel

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American Railroad Engineering
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National Fire Protection Agency

National Electrical Testing Agency

General Background:

On January 5, 2022 around 8:00PM EST, Tim Weiser, PE was called by David Kosla with CSX to request an electrical inspection be conducted. The electrical inspection request was to identifying if the South Tower electrical could be turned ON, and to identify if there were any existing National Electrical Code discrepancies with respect to Article 500 and Article 501.

On January 6, 2022, Alfred Soliman, PE with Weiser Engineering traveled to CSX Curtis Bay Coal Pier to conduct an inspection, and arrived onsite at approximately 11:30AM EST.

When arriving onsite, Alfred immediately met with Sr. On-Scene Coordinator Michael Austin, with CSX Transportation. Michael is the Director of Hazardous Materials / Special Agent to discuss Field Report. Michael designated Dyron Hamlin, a Principal with GHD to supervise the inspection. When completing the South Tunnel inspection, Alfred met with Michael to debrief on his findings.

At approximately 7:30PM EST, Alfred departed the CSX Curtis Bay Coal Pier.

Findings:

Below is a list of National Electrical Code (NEC) Article 500 and Article 501 discrepancies found during the South Tunnel inspection by category. It should be noted that during the inspection, no power was available for illuminating the space, rather flashlights were utilized to identify the discrepancies.

Electrical Distribution Equipment Requiring Correction:

- It was found that there is a 480Y/277V panelboard located within the existing South Tunnel which is NEMA 3R outdoor rated, and not rated for Class 1, Division 2. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.
- It was found that there is an electrical disconnect switch located within the existing South Tunnel which is NEMA 3R, outdoor rated, and not rated for Class 1, Division 2. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.
- It was found that there is an electrical control panel with lighting branch circuit breakers within the existing South Tunnel which is rated for NEMA 12, and not rated for Class 1, Division 2. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.



- It was found that there is an electrical motor control cabinet housing a variable frequency drive (VFD) controlling the exhaust fans which is not rated for Class 1, Division 2. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.

Lighting Systems Requiring Correction:

- Newly installed lighting fixtures within the South Tunnel were haphazardly installed by not installing per the SSI Lighting Manufacturers requirements. Rather, a forced direct replacement to install fixtures without conducting any electrical rework to maintain NEC Article 500, and Article 501 requirements for Class 1, Division 2 locations.
- It was found that there was a recent lighting retrofit replacing the originally installed Champion Cat# DMVFB039/120 Class 1, Division 2 fixtures with new SSI Cat# HLV2AQ & HLV4AQ LED type linear fixtures. The newly installed light fixtures are also being Class 1, Division 2 rated. Although the new LED light fixtures were properly specified, the installation was improper to protect the integrity of the hazardous classified space. This was due to:
 - Existing Champion light fixtures were removed with retaining the existing termination box in place. The existing termination box was then reused to install the new SSI light fixture in order to retain the existing circuitry as found.
 - The SSI fixture is provided with a 0.5" diameter coin plug opening for wiring entrance conduits. Due to the original conduit and wiring not properly mating with this opening, the installer drilled out the rear of the light fixture to route wiring voiding the manufacturers warranty and integrity of the fixture's classification.
 - The mating of the new SSI fixture to the existing Champion termination box does not have a proper seal for Class 1, Division 1 locations with gaps along the seal and in some locations branch circuit wiring is visible.
 - In some locations, it was found that due to congestion of existing systems such as conduits, and conduit supports, the installed SSI fixtures were not even flush with the back box causing additional gaps in lieu of providing the proper fixture type.

Motor Rated Switches Requiring Correction:

- Switch marked as "SP-SWITCH" during our walkthrough is improperly installed since it did not house proper seal-offs located 18-inches from the entrance of the switch. Due to switching being a high sparking method, seal-offs are required within 18-inches. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.
- Switch marked as "SW2" during our walkthrough is improperly installed since it did not house proper seal-offs located 18-inches from the entrance of the switch. Due to switching being a high sparking method, seal-offs are required within 18-inches. This

installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.

Junction Boxes Requiring Correction:

- Multiple Class 1, Division 2 junction boxes housing splices and terminations within the South Tunnel were installed without any seal-offs entering or exiting the Class 1, Division 2 box. The discrepancy is that these junction boxes interconnect other junction boxes within the South Tunnel. Per NEC Table 501.1, where two explosion proof enclosures with a conduit run between them greater than 36", seal-offs are required 18" of each enclosure. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.
- It was found that one Class 1, Division 2 junction box was missing 4 screws to properly secure the cover per the manufacturers design. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.
- In many cases, the covers to the junction boxes were not properly tightened and were finger loose. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.

Electrical Receptacles Requiring Correction:

- Two (2) receptacles are installed below the control panel which are NEMA 4X, and not Class 1, Division 2 rated. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.

Miscellaneous Findings:

- It was found that non-Class 1, Division 2 rated cables were utilized and are required to be removed. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.
- It was found that an extension cord along with SO Type cord and plugs were within the space and are required to be removed. This installation does not meet the National Electrical Code Article 500, and Article 501 requirements for Class 1, Division 2 locations.

[Link for pictures](#)



Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 54186, expiration date April 11, 2023.