

PREDL SYSTEMS

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Project: Vacuum Testing on 48" PVC Manhole (as named by client)-Reference standard-ASTM C1244-11

1.0 INTRODUCTION

As requested, Metro Testing Laboratories (Burnaby), a division of CCMET Inc. (Metro) visited PREDL Systems plant to perform vacuum testing on 48" PVC manhole on 8 June 2018. Metro conducted the test as per ASTM C1244-11 Standard. There were several meetings in past between Metro and PREDL Systems since May 2018 to plan, design, and arrange for the vacuum testing.

Client confirmed that the tested manhole is manufactured with the similar consistency as the actual service manholes. It was concentric type of manhole (as shown in figure.1).

As informed by the client, Hamilton Kent, Tylox Type "C" gasket, Model 5796 (called gasket in this report) as an ASTM C443ASTM compliant Manhole Riser gasket, was used.

ConSeal, CS-102 Butyl Rubber Sealant (called mastic in this report) were used in the manhole assembly. As per the materials technical data sheet of the material, the mastic is an ASTM C990-compliant Butyl Mastic Sealant. The Manhole was tested in two different assembly configurations:

- **Configuration 1:**

Gaskets were installed at the top and bottom vertical interfaces of PVC pipe and concrete pieces. One layer of the mastic was observed at the bottom horizontal interface of the PVC pipe and concrete base (pressed thickness of the mastic was 1-2 mm). The manhole assembly was the same as the one which was used in the load testing conducted by Metro on May 17, 2018 with the same elements and configuration. It should be noted that for both configurations, the top lid was replaced with an airtight lid (See picture 2).

- **Configuration 2:** Gaskets were removed and two ¾" thick mastics were installed at the top and bottom horizontal interface of PVC pipe and concrete portions.

2.0 TESTING PROCEDURE AND RESULTS

Metro used Karol Wagner Vacuum Gauge (Serial Number 7686) which was factory calibrated on April 4, 2018. The absolute atmosphere pressure was measured 759 mm HG at the Diamond Precast yard level (see Picture 1). Metro relatively decreased the pressure up to 254 mm HG (10 in of HG) (Absolute pressure $759-254=505$ mm HG) and shut the valve to disconnect the manhole from the vacuum pump. Metro then measured the time for the manhole pressure to drop from 10" HG to 9" HG (Absolute pressure drop from 505 mm HG to 531 mm HG).

Metro repeated the test twice for each configuration. For the first configuration the recorded time was **30** and **35 seconds**. For the second configuration for the first round of the test, the first measured time was 195 seconds and for the second time it was more than 300 second (the test stopped at 5 minute (300 second) at 524 mm HG.

As per the ASTM Table 1 for the Manhole with a nominal 48 in of the diameter and 6 feet depth, the minimum specified time is **15 seconds**.

3.0 Conclusion:

As per test results, Both Manhole configurations have successfully passed the test and meet of ASTM C1244-11 specifications.

We trust that this report meets your present requirements; if you have any questions, please feel free to contact us at 604-436-9111.

Metro Testing Laboratories (Burnaby)
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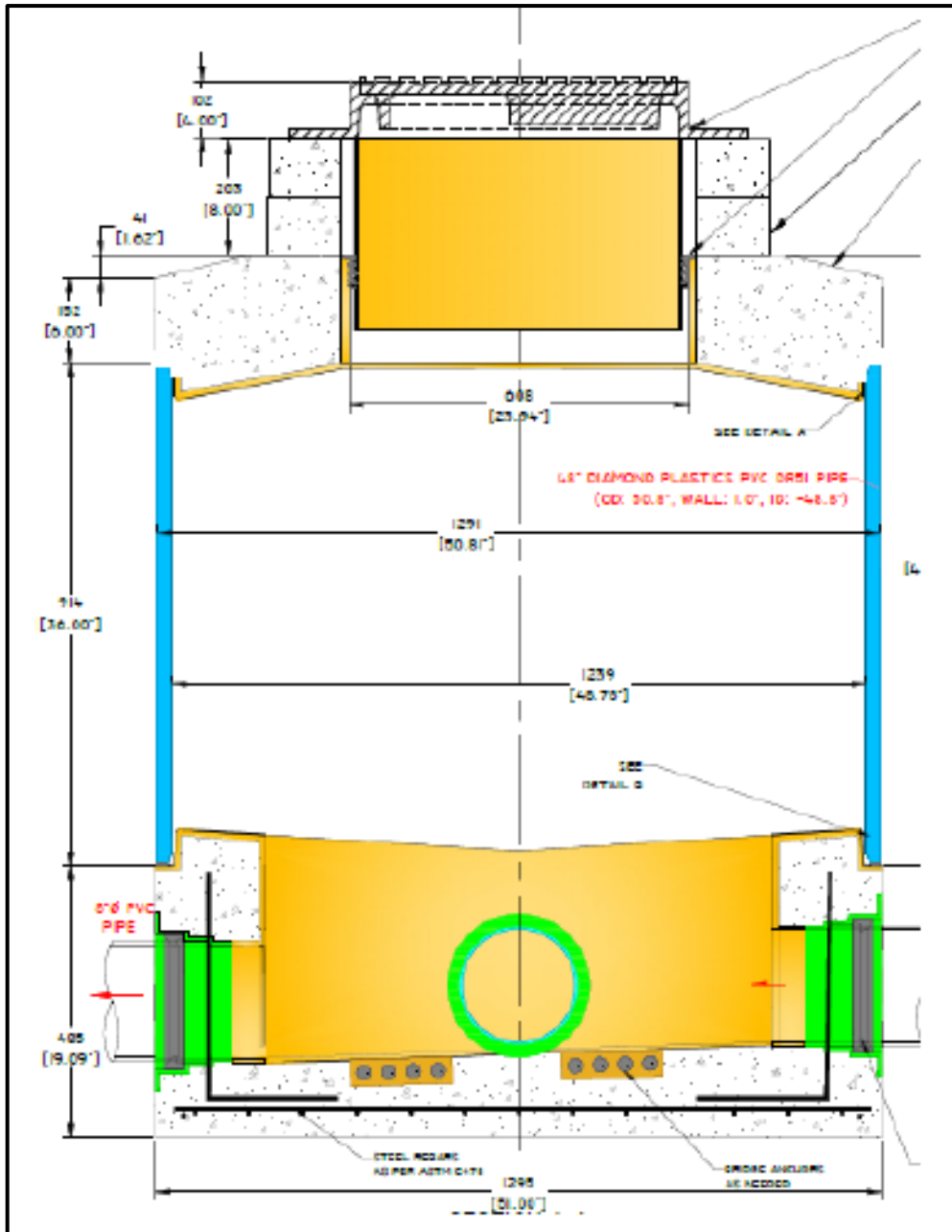


Figure 1- Schematic Manhole Assembly



Figure 2- Installed lid with vacuum rubber

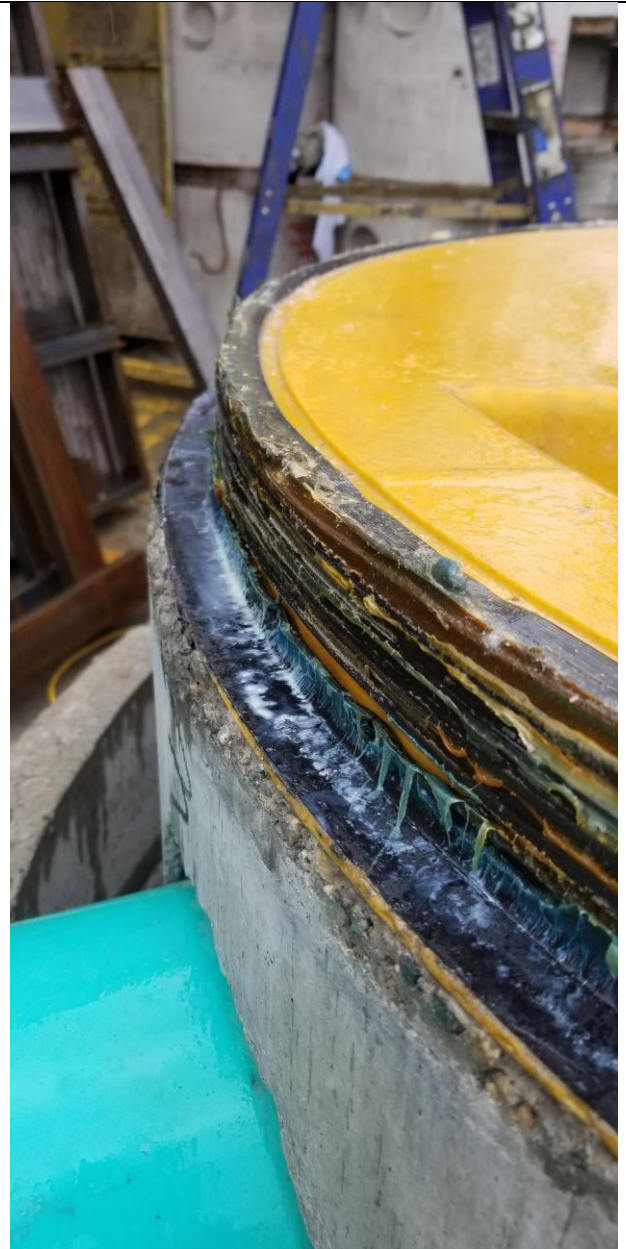


Figure 3- Installed gasket (Assembly Configuration 1)



Figure 4- Installed mastic (Assembly configuration 2).
19 mm thickness before installing the concrete cap



Figure 5- Installed mastic (Assembly configuration 2).
1-2 mm thickness after installing the concrete cap