

Appendix C

Primary Clarifier 1 Structural Inspection Report



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Project name:
NEWPCC Primary Clarifier 1 Condition
Assessment

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Technical Memorandum

Subject: NEWPCC Primary Clarifier 1 – Structural Condition Assessment

1.0 Introduction

The North End Water Pollution Control Centre (NEWPCC) is undergoing various upgrades, including the existing primary clarification facility. As part of this work, a new Primary Scum Dewatering Facility will be constructed adjacent to the existing Primary Clarifier 1, which will remain online throughout construction. The City retained AECOM to complete a condition assessment of Primary Clarifier 1 to determine its existing condition prior to construction of the forthcoming Primary Scum Dewatering Facility.

The condition assessment was conducted by Matthew Brotherston (AECOM) on May 21, 2024. A review was conducted of the launder from grade level adjacent to the clarifier. In addition, an assessment of the existing concrete base slab and walls of the clarifier was conducted from the interior of the clarifier. This internal review was conducted from the base slab level of the clarifier, as such a review of the upper portion of the walls was limited to what could be seen from below. The review conducted was visual only, no destructive testing was conducted.

2.0 Primary Clarifier 1 Condition Assessment Results

In general, Primary Clarifier 1 is in good condition. No deficiencies were noted that would require immediate repair.

The upper surfaces of the launder are in good condition with no signs of degradation or cracking. At the time of review, water was still present in the bottom of the launder so this portion could not be reviewed.

Within the clarifier, damage was noted at the underside of the launder. It appears that cement has eroded from the concrete surface, leaving aggregate exposed. In several locations pieces of steel were visible, although the steel did not appear to be reinforcing steel and are likely related to form supports from the original construction. This damage was consistent around the entire perimeter of the clarifier. No cracking was noted on the inside vertical face of the launder.

The concrete walls of the clarifier below the launder appeared to be in relatively good condition. The erosion noted on the underside of the launder was not apparent on the walls. There were signs throughout that there have been issues with cracks in the wall in the past that appear to have been repaired with some type of sealant or coating. Due to this, the width and

extent of these repaired cracks could not be determined. However, it should be noted that no cracks were visible through the repairs. No further active cracks were noted in the walls.

As with the walls, the base slab of the clarifier was noted to be in relatively good condition. The concrete appeared to be covered by a protective coating. The coating appeared to be generally intact and no signs of erosion of the concrete were apparent. One large crack was noted that extended from the centre of the clarifier to the perimeter wall. In addition, cracks were noted in the base slab approximately 300 mm from the perimeter wall. These cracks were present around approximately 2/3rds of the perimeter of the tank. The cracks did not appear to have been repaired at any point in the past. No reinforcing steel was visible in any of the cracks and there were limited signs of spalling.

The steel clarifier mechanism appeared to be in generally good condition with no signs of excessive corrosion, however a detailed review of the steel was not conducted.



Photo 1: Overall view of drained Primary Clarifier 1



Photo Error! No text of specified style in document.: View of launder from above



Photo 3: View of side of launder from above



Photo 4: Eroded concrete at underside of launder



Photo 5: Repaired crack in wall of clarifier



Photo 6: Corroded connection brackets in the side of launder



Photo 7: Signs of repaired cracks in wall of clarifier



Photo 8: Crack in base slab of clarifier parallel to perimeter of tank



Photo 9: Crack in base slab of clarifier extending from center to exterior wall

3.0 Conclusion

None of the deficiencies noted above pose an imminent risk to the structural integrity of Primary Clarifier 1.

The erosion of the concrete on the underside of the launder should be repaired in the future before the erosion progresses to the point of exposing the reinforcing steel to the water. If this occurs, the steel will corrode and cause spalling of the concrete. At that point, required repairs would be much more extensive than what is currently required.

The cracks in the walls of the clarifier appear to have been adequately repaired. It was not determined when these repairs were completed, however there is currently no sign of further cracking. No further repairs are required at this time; however, the repairs should be reviewed as part of regular maintenance to catch early signs of failure of the repairs.

The cracks in the base slab appear more extensive than those in the walls and show no signs of repair. As the City of Winnipeg has not noted any large loss of water volume from the clarifier, the cracks likely do not extend through the entire depth of the slab at this time, though this could not be confirmed by a visual review. There were no signs of corrosion staining around the cracks and limited concrete spalling was observed, so it would appear that at this time the reinforcing steel has not been subject to corrosion. The cracks should be adequately repaired before they become more extensive.



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