



CSO Master Plan

Part 3B – District Engineering Plans

August 2019

City of Winnipeg



CSO Master Plan

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Document History and Status

Revision	Date	Description	By	Review	Approved
0	02/15/2019	First Draft Submission For City Review	SB	SG	
1	08/02/2019	Final Draft Submission	SG	MF / DT	JB / DJT
2	08/08/2019	Final Submission For CSO Master Plan	MF	MF	JB / DJT

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Acronyms and Abbreviations

CSO	Combined Sewer Overflow
DEP	district engineering plan
No.	Number
O&M	operations and maintenance

1. Introduction

1.1 Purpose

This document forms as part of the combined sewer overflow (CSO) Master Plan submission, specifically Part 3B – District Engineering Plans. Its purpose is to provide a summary of the scope and organization of the District Engineering Plans (DEPs) developed for each combined sewer district.

This is a supporting document to both the Part 3A – Master Plan Summary report and Part 3C – Standard Details that all form Part 3 of the CSO Master Plan. Part 3A of the CSO Master Plan provides a summary of the proposed Master Plan, while Part 3C describes the control option technologies selected as representative for use in the development of the CSO Master Plan.

Each of the DEPs for the 43 combined sewer districts are included in alphabetical order in Appendix A. The documentation includes information on the district as it currently exists as well as information on the planned CSO Master Plan upgrades developed.

The DEPs are identified as “living documents”. New information and modifications to the plans are to be completed as the preliminary and detailed design of solutions in specific districts are underway, and as specific projects are completed.

1.2 Background

The Province of Manitoba’s Environment Act Licence No. 3042 requires the development of detailed engineering plans as part of the CSO Master Plan submission. Clause 11 includes the following requirement:

The Licencee shall, on or before December 31, 2017, file a final Master Plan, including the detailed engineering plans, proposed monitoring plan, and implementation schedule for the approved design identified in the preliminary plan above. The Master Plan is to be filed for approval by the Director. The Licencee shall implement the plan by December 31, 2030, unless otherwise approved by the Director.

This requirement was then confirmed in the Province’s written response to the Preliminary Proposal, submitted November 24, 2017:

Accordingly, please submit to me for approval a Master Plan including detailed engineering plans, proposed monitoring plans, and an implementation schedule for Control Option No. 1 as identified in your CSO Master Plan Preliminary Proposal on or before August 31, 2019 and for Control Option No. 2 as identified in your CSO Master Plan Preliminary Proposal on or before April 30, 2030.

Although identified as “detailed” plans in the current licence and Preliminary Proposal response letter, the proposed control option solutions within each DEP included in this CSO Master Plan have been developed to a conceptual level of detail. This is considered suitable for the level of study completed during a master planning project of this nature. The preliminary and detailed levels of design will be completed for each of the solutions recommended in the DEPs once the specific solution is to be implemented in that district. As a result of this, the plans were suggested to be referred to as “district engineering plans” instead of detailed engineering plans, to avoid the potential confusion that would be assumed that the plans were at a detailed level of design. This approach was confirmed with Manitoba Sustainable Development at the June 15, 2018 Regulatory Working Committee meeting as part of the CSO Master Plan development.

A template structure for the content of the DEPs was also provided to Manitoba Sustainable Development at the June 15, 2018 Regulatory Working Committee meeting. This standard template was then utilized to

streamline the creation of the remaining plans. This template will be maintained and used for future sewer planning efforts by the City Of Winnipeg in specific districts.

The DEPs identify and describe the proposed projects for each district that will achieve the 85 percent capture in a representative year target, but do not identify their order of implementation. The sequence of project implementation may be reordered at any time to accommodate potential changes to the CSO Master Plan in the future.

1.3 Overview of the District Engineering Plans

Each DEP is written as a standalone document, to allow for each DEP to be used independently. Each plan is organized in several sections to detail the existing system, planned work and the proposed project selection.

Each section of the DEPs is described as follows:

- **District Description:** Describes the sewer district location, land use, major landmarks and regional roadways. Features of historical, development or functional relevance are also described.
- **Development:** Includes a description of ongoing or planned developments that may impact the proposed solutions or present an opportunity for collaboration in relation to the CSO Master Plan work.
- **Existing Sewer System:** Describes the existing sewer collection system. A description of the existing collection system is provided in detail and gives a baseline understanding of the current sewer infrastructure for the district. Each district varies and may include any combination of a lift station, flood pumping station, weir diversion structures, gate and sluice chambers and outfall structures. Descriptions of the major flow pattern during dry weather and wet weather flow are also described. Interactions with other districts have been identified in figures within each plan and an overall district interaction overview map is provided as Appendix B.

This section also includes a summary of existing asset data, district interconnections and critical asset data points relevant to the CSO Master Plan. Street locations, invert elevations, asset ID numbers are provided for reference for the district interconnections, as well as what district they flow to/from and whether they are gravity or pumped interconnections. Important features such as high point manholes are also provided.

- **Investment Work:** Describes previous investments and sewer related construction, or combined sewer studies completed in the district. It provides a summary of the district status in terms of data capture and lists the last study completed. This work might relate to basement flooding relief or the sewer infrastructure, flow monitoring or maintenance or calibration of permanent CSO monitoring instruments installed.
- **Control Option No. 1 Projects:** This section describes the solutions proposed for each sewer district, provides the specific details of the solutions and forms a fundamental component of the DEPs in relation to meeting the Control Option No. 1 performance target. Key design considerations are listed for each selected technology. Overview and detailed maps for the selected control options are included with each DEP to provide an indication of location and potential construction complexity.
- **Systems Operations and Maintenance:** Describes an overview of the operations and maintenance implications for each technology solution recommended in the sewer district to meet Control Option No. 1.
- **Performance Estimate:** This section summarizes the modelled performance of the proposed control solutions to provide justification of their selection. This section also provides a performance comparison to the Preliminary Proposal model results. Basic details of major updates or outstanding work within the hydraulic model for the specific district is also included, where applicable.
- **Cost Estimates:** Summarizes the capital cost estimates and provides a comparison of the capital cost estimates developed within the Preliminary Proposal. The operations and maintenance (O&M) costs are also documented, in terms of the 35-year present value cost of the O&M of the proposed

control options, and in terms of the average annual additional O&M costs in 2019 dollars. The overall CSO Master Plan cost estimate summary for the sewer districts is included as Appendix C for reference. A Basis of Estimate Technical Memorandum was developed and is included as Appendix C of the Part 2 report and documents the process that was used to develop the capital cost estimates in this section.

- **Meeting Future Performance Targets:** Describes the potential approach to meeting the future performance target of Control Option No. 2, as part of the 2030 CSO Master Plan update. A risk assessment is also included in this section in terms of the likelihood of complete separation being the only feasible solution to meet future performance targets.
- **Risks and Opportunities:** Identifies the risks and opportunities applicable to the control solutions recommended within each sewer district to meet Control Option No. 1. The applicable risks and opportunities specific to the sewer districts are also identified within this section where applicable. A description of each risk component as it applies for each control option type is identified in Appendix D.

Appendix A
District Engineering Plans

Appendix B
District Interconnection Overview Map

Appendix C

Cost Estimates

Appendix D

Risk and Opportunity Matrix