City of Winnipeg

Combined Sewer District Preliminary Design Report Template

Document No. 1

May 2021

City of Winnipeg

City of Winnipeg Water and Waste Department

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| Combined Sewer District Preliminary Design Report Template |
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| Prepared by: | City of Winnipeg Water and Waste DepartmentWastewater Planning and Project Delivery Branch |
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**INTERNAL Document History and Status (Hidden Text)**

| **Revision** | **Prepared by** | **Date** | **Reviewed by** | **Date** | **Approved By** | **Date** | **Revision Comments** |
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| 0.1 | FL | 27/08/2020 | PTC | 17/09/2020 |  |  | First revision |
| 0.2 | FL | 02/11/2020 | PTC | 19/11/2020 |  |  | Incorporated DEP guide |
| 0.3 | FL | 15/01/2021 | PTC | 6/05/2021 | PTC | 6/05/2021 | Aligned report with RFP requirements, converted all guidance to hidden texts |
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**Document History and Status**

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Note: This template document includes all the mandatory sections required for the Preliminary Design Report. Supplementary sections are encouraged to be provided to support the assessment. Alternation to any of the mandatory sections can only be made with approvals from the City Project Manager.

Use the *Show/Hide ¶* button to display the hidden text for report guidelines.

# Document General Guidelines

* The intent of this document is to ensure all the preliminary design components are included in the Preliminary Design Report deliverable. Supplementary sections are encouraged to be provided to support the assessment. Removal of any of the required sections or inclusion of additional sections shall be proposed for approval from the City of Winnipeg’s Project Manager (PM).
* Use the *Show/Hide ¶* button to display the hidden text under each section. The hidden text provides a description and the order of information to be included.
* There is a need to modify language from the Conceptual phase as some conceptual solutions for example may not be taken forward to Preliminary Design. As the CSO Master Plan has had a long document history there are challenges with the repeating and conflicting use of common terms. The consultant should raise any identified conflicts not addressed and propose an approach to manage them.
* This report should be completed based on the specific Request for Proposal, Consultant proposal and organized and documented as per this template.
* Program Description
	+ All the Conceptual control option 1 solutions are to be identified as “proposed”. (would be)
		- Be consistent
	+ For land acquisition, avoid use of the term expropriation, as this will become a public document and can be taken out of context.
	+ Projects are defined at a planning level and are always subject to change
* Acronyms and Abbreviations
	+ Use percent instead of % at all times where possible, except for figures and tables, eg. use “98 percent”
	+ Write out ‘Avenue’ or ‘Street’ or ‘Boulevard’ or ‘Road’ in full in each case – please do not use Ave. or St. or Rd. or Blvd
	+ Keep a master acronym list
* Capitalization – for consistency
	+ don’t capitalize ‘industrial’ or ‘commercial’ or ‘agricultural’
	+ do not capitalize ‘district’
* Decimal Places
	+ Varies by item being measured
	+ Be consistent
* Dimensional Units
	+ Common engineering units do not need to be defined, eg. use ha, m, mm, m3/s
	+ Litre is abbreviated with capital L to avoid confusion with number 1
	+ Use abbreviations, eg. “m” instead of metres
	+ Do not hyphenate, use 600 mm instead of 600-mm
* Numbers
	+ Spell numbers less than 10, eg nine
* Spelling and Word Use
	+ Impervious instead of impermeable
	+ Complete separation has two meanings
		- The whole district may have road drainage separation (fully separated)
		- All of a sewer sub-area may have road drainage separation, but not the whole district
			* Partial separation has a unique meaning and should not be used to describe a district that is not fully separated
	+ The definition of Control Option is interchangeable depending on the context. It can refer to the type of control (eg. in-line), or the level of performance (eg. CSO Master Plan Control Option No. 1 refers to the target 85 percent capture of CSO volume capture for the 1992 Representative Year). When referring to the Citywide control options, CSO Master Plan should distinguish between alternative meaning.
	+ “Southwest” is one word
	+ “force main” is two words
	+ lifecycle is one word
	+ small streams
	+ railway instead of rail line
	+ Remove all commas and hyphenations
* 1,000-mm becomes 1000 mm
	+ regional street instead of regional roadway
		- https://www.winnipeg.ca/publicworks/trafficControl/pdf/regionalStreetNetwork-MAP.pdf
	+ Keep consistent with preliminary proposal and district conceptual plans.
		- “in-line”
		- “off-line”
* Any uncertain data requires a short paragraph providing details and location
	+ In the 60 percent draft, highlight in yellow and comment to identify data that will be updated
* Include commentary on thought process with positioning of control structures, control options (i.e. off-line tanks), etc.

# District Plan Maps Guidelines

*Refer to past CSO Master Plan’s DEP maps as reference. If no changes are required, District Plan drawings should be used.*

**District Overview Map Guidelines**

* Separate Areas Linework
	+ Include appropriate linework to differentiate areas within district which have been separated but still discharge into what remains of the CS System in that district.
		- Example that demonstrates this: Mager, the majority of this district has been separated, but the District Overview map does not communicate this.
	+ The linework for sewer separation areas should be further clarified to have one linework for fully separated areas in which the LDS component discharges to river, and “separation ready” areas in which the LDS component discharges to the existing CS pipe network.
	+ Include as well linework to show areas that are not currently separated but are planned to be separated as part of the CSO Master Plan Control Options.
* Percent Separate Areas
	+ *Include the approximate percent of the area of the district considered fully separated and separate ready by the legend of the map.*

**District Detail Map Guidelines**

* *Illustrate the location of the current interception weir in the map.*
* *Identify critical locations and elevations*

Executive Summary

* *Provide the summary of the preliminary design study*

Table of Contents *(include all headings, figures, tables and appendices with their commencing page numbers)*

Acronyms and Abbreviations

* *Provide the list of the acronyms and abbreviations used throughout the report.*

BFR Basement Flooding Relief

City City of Winnipeg

CS combined sewer

CSO combined sewer overflow

CSO MP Combined Sewer Overflow Master Plan

DEP District Engineering Plan

EA Environment Act Licence

GI green infrastructure

GIS Geographic Information System

LDS land drainage sewer

MCC Manitoba Conversation and Climate

MSD Manitoba Sustainable Development

NEWPCC North End Sewage Treatment Plant

O&M operations and maintenance

Province Government of Manitoba

PM Project Manager

PWWF peak wet weather flow

RTC real time control

SEWPCC South End Sewage Treatment Plant

SRS storm relief sewer

WEWPCC West End Sewage Treatment Plant

WSER Wastewater Systems Effluent Regulations

WWF wet weather flow

WWS wastewater sewer

# Introduction

* *For this and other sections where information is still accurate and relevant from the district plan should be retained for efficiency and consistency.*
* *New sections should start on a new page.*
* *Provide an overview of the district, describe the objective and scope of the preliminary design study.*

#

# Data Collection and Assessment

* *Summarize the Data Collection and Assessment phase and include TM in the Appendix of the final version.*
* *Summarizes any outstanding data gaps and assumptions, distinguishing between those that have been accepted by the City or the proposed plans to address or mediate further.*
* *Summarize model updates. The hydraulic modelling TM is an appendix in the data Collection and Assessment TM.*
* *Confirm the hydraulic model was deemed fit for purpose for assessing the district needs and developing solutions to address the needs.*

#

# Background

* *Provide introductory paragraph(s) to the sub-sections that will be discussed.*
* *Refer to the District Engineering Plan (DEP) for information. Confirm the DEP description. If modification is required, specify it.*

## District Description

* *Describe the region of city or general location within combined sewer area*
* *Do not relate to adjacent sewer district names*
* *Avoid describing sewer system information in this section*
* *Describe major landmarks and regional roadways*
* *Identify regional streets, boundary roads, Railways, Rivers and streams*
* *Provide maps to illustrate the district information discussed in this section*
* *Identify land use*
	+ *Describe residential area*
	+ *Describe major commercial/industrial*
	+ *Describe green space*
	+ *Identify Major features of historical, development or functional relevance*
		- *Only discuss significant buildings in the district (i.e. ones that keep up space or are important / unique), e.g. university, shopping mall*

## Development

* *Identify briefly describe recent developments*
	+ *Recently completed or currently under construction*
	+ *Characteristics – what is it, how will it affect drainage/sewage*
	+ *Potential impacts to CSO Master Plan*
* *Document and describe planned developments, proposed developments and significant projects planned within the next 35-year design horizon that will impact the district performance.*
	+ *This should be primarily focused on the District but major infrastructure such as significant interceptor capacity changes, treatment plant capacity changes, upstream district changes and adjacent interconnected districts changes should be included where impacts are considered to be significant*
	+ *Schedule if known*
	+ *Characteristics – what is it, how will it affect drainage/sewage*
	+ *Identify which developments have been included in City future network scenario used in the CSO Master Plan and which development need to be included*
	+ *Include a high, medium and low appraisal of the likely hood planned changes will be completed in the design horizon*
* *Potential impacts to CSO Master Plan*
	+ *High level commentary on any significant changes to the developments on future CSO performance from CSO Master Plan 2037 Future Model*

## Existing Sewer System

* *Describe collection system information, combined, separated areas*
	+ *Service area – size ha*
	+ *Document the approximate percent of the area of the district considered fully separated (LDS system discharges to dedicated outfall) and separate ready (separation completed, but LDS still discharges into CS system) at the time of writing.*
		- *Show separation sections on figures/maps*
		- *State right away what area of the district is combined and what is separated*
		- *Provide approximate area of what is separated and separate ready*
		- *Portions that are separated but the LDS reconnects to the CS is considered “Separate Ready”.*
	+ *Describe major flow pattern, pipe routing, WPCC (DWF and WWF)*
	+ *Describe in order: CS / WWS, SRS, LDS*
		- *Describe completed relief sewers or separation works*
		- *Lift stations, flood pumping station, force main*
* *Identify known operational issues or unique features*
* *Discuss major LDS outfalls and networks*
* *Comment on significant areas of LDSs that drain in the CS system*
* *Identify additional outfalls within the district if applicable, and describe their operations under high return design storms. If any outfalls have been decommissioned, specify them.*
* *List Outfalls and provide city outfall asset IDs*
	+ *Eg. The two combined sewer outfalls to the Red River are as follows:*
		- *ID1 (Asset ID: …) – Cockburn Combined Sewer Outfall*
		- *ID87 (Asset ID: …) – Cockburn Flood Pump Station Outfall*

### District-to-District Interconnections

* *Provide a figure illustrating all the district-to-district interconnections between the district of interest and the surrounding district and locations where gravity flow can cross from one to another. Provide the list of interconnections in the section below.*

### Interceptor Connections – Downstream of Primary Weir

* *Describe the interceptor connection(s) located downstream of primary weir*

*Example:*

***Riverbend Park (Area 9 NW)***

* *The 2250 mm Main Interceptor pipe flows north by gravity on Main Street from the Armstrong district to the Riverbend Park) district:*
	+ *Invert at Armstrong district boundary 215.85 m (S-MH00000791)*

### Interceptor Connections – Upstream of Primary Weir

* *Describe the interceptor connection(s) located upstream of primary weir*

*Example:*

***Newton***

* *The 2250 mm Interceptor pipe flows north by gravity on Main Street into the Armstrong district to the NEWPCC:*
	+ *Invert at Newton district boundary 216.61 m (S-MA00000807)*

### District Connections

* *Identify all the neighbouring district(s) connections associated with the district of interest. Sort the list by district name.*

*[District Name]*

*Interact with district CS system*

*CS to CS - LDS to CS - WWS to CS - CS to SRS - SRS to SRS - WWS to WWS - LDS to LDS*

* *Identify known interconnections: type, location and elevations*
	+ *Include asset id for reference*
	+ *Clarify gravity or pumped interconnections*
	+ *For high point manholes where the high point varies for the upstream pipes in each district, that the elevations referencing each district be provided. If the upstream pipe invert on both sides of the high point manhole was the same, the single elevation would be referenced:*
* *Example from Aubrey Report: Henry Avenue and Tecumseh Street – 228.95 m References Alexander District, 229.96m References Aubrey District (S-MH20017866)*
	+ *Ensure high sewer overflow district-to-district crossings are described as shown below:*
* *“Notre Dame Avenue and Home Street – 229.44 m (S-MA20018115)” becomes*
* *A 300 mm SRS overflow pipe diverts flow from Aubrey district CS system at Notre Dame Avenue and Home Street, and then flow by gravity northbound along Home Street and flows into Bannatyne district SRS system.*
* *Notre Dame Avenue and Home Street SRS Overflow Invert (Top Of Overflow Weir) Into 300 SRS – 229.44 m (Manhole ID No: S-MH20016212)*
	+ *What districts they flow to and from*
	+ *Provide the high point or overflow invert at the high point manhole or overflow pipe interconnection, or provide the invert at the manhole nearest to the district boundary where it is a gravity flow discharge into the district.*
	+ *Describe if the interconnection flows interact with the CS system of the district in anyway.*
		- *If the interconnection is from neighboring LDS pipework, which flows into a partially separated area of the district which flows eventually into an LDS outfall, then this interconnection does not interact with the CS system.*
		- *If the interconnection is from a neighboring LDS that flows into partially separated LDS in the district in question, but eventually that LDS pipe flows back into the existing CS, then the interconnection does interact with the CS system.*
		- *Provide a qualitative assessment of the level of interaction. Is it an interconnection that flows by gravity into the CS system of the district in question, and therefore a known frequent interaction under all storm events? Or is it a high point manhole or overflow pipe, where only under certain magnitude storm events it will occur? Based on the height difference between the invert of the pipe and the overflow, is it only for very infrequent storms this interaction occurs, or for say two-year or five-year storms?*
	+ *Identify Interconnection relevance to CSO control if Operational in Control Option Solutions*
		- *Lowest relief interconnection*
		- *In-line backs up into relief pipes*
		- *In-line backs up into adjacent districts*
		- *In-line discharged through overflow*
		- *If only affects basement flooding protection*

*Example:*

***Maples (Area 3 [NW])***

*LDS to CS*

* *The 2700 mm LDS main sewer trunk flows by gravity east on Leila Avenue into the Armstrong district:*
	+ *Invert at the Maples (Area 3 (NW)) district boundary 226.54 m (S-MA00002447)*
* *Provide a district interconnection schematic that illustrates the collection areas, interconnections, flow controls, pumping stations, and discharge points for the existing system. See district interconnection schematic example in Figure 3‑1*



**Figure 3‑1.** **District Interconnection Schematic Example**

### Asset Information

*Provide a district overview map that illustrates the main sewer system features for the district. Identify all the main system features in the Table 3‑1. Describe any unique features from the map or table.*

Table A. Sewer District Existing Asset Information

*Retain the format of the table. Confirm the information provided from the district DEP.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset | Asset ID (Model) | Asset ID (GIS) | Characteristics | Comments |
| Combined Sewer Outfall (ID#) |  |  | size | Invert:  |
| Flood Pumping Outfall (ID#) |  |  | size | Invert: |
| Other Overflows (ID#) |  |  |  | Invert: |
| Main Trunk |  |  | size | Invert: |
| SRS Outfalls (ID#) |  |  |  | Invert: |
| SRS Interconnections *(reference SRS interconnections in the appendix if there are too many of them to be listed)* |  |  | location |  |
| Main Trunk Flap Gate |  |  | size | Invert: |
| Main Trunk Sluice Gate |  |  | size | Invert: |
| Off-Take |  |  | size | Invert: |
| Dry Well |  |  | Type/size |  |
| Lift Station Total Capacity *(installed capacity)* |  |  | Q |  |
| Lift Station ADWF |  |  | Q |  |
| Lift Station Force Main |  |  | Number and dia. | Invert: |
| Flood Pump Station Total Capacity |  |  | Q |  |
| Pass Forward Flow – First Overflow |  |  | Q |  |
| Notes:ADWF = average dry-weather flowN/A = not applicable |

* *Include a table with critical system elevations relevant to the development of the Combined Sewer Overflow (CSO) control options. See Table 3‑2 for the Critical Elevations Table.*
* *Identify critical elevation reference points on the District Overview Map.*

Table B. Critical Elevations Table

*Retain the format of table, provide additional information as required.*

|  |  |  |
| --- | --- | --- |
| Reference Point | Item | Elevation (m)a |
| 1 | Normal Summer River Level | *District – 222.22 m* |
| 2 | Trunk Invert at Off-Take  | *222.22 m* |
| 3 | Top of Weir | *222.22 m* |
| 4 | Relief Outfall Invert at Flap Gate | *222.22 m* |
| 5 | Low Relief Interconnection (Asset GIS ID) | *222.22 m* |
| 6 | Sewer District Interconnection (specify district name) | *222.22 m* |
| 7 | Low Basement | *222.22 m* |
| 8 | Flood Protection Level(s)  | *222.22 m* |
|  |

### System Operations and Maintenance

* *Describe the current operations and maintenance process required for the district*

## Previous Investment Work

* *Describe previous work completed in the district. ie. past studies, sewer related construction, sewer cleaning, CCTV program, flow monitoring and etc. Include proper referencing of study/report*
* *Provide a summary of the historic district status in terms of data capture and study in the Table 3‑3.*

Table C. District Status

*Retain the format of the table. Update the content.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| District | Most Recent Study | Flow Monitoring | Hydraulic Model | Status | Expected Completion |
| *Example. Cockburn* | *2010 - Conceptual* | *Yes* | *2013 Baseline* | *Under Construction* | *TBD* |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| *Note:TBD = To Be Determined* |

## Ongoing Investment Work

* *Describe any planned, proposed or in progress projects, i.e. basement flooding relief, lift stations rehabilitation and etc.*

#

# Preliminary Design Hydraulic Modeling

* *Any additional changes following the Data Collection and Assessment phase should be documented in this section.*
* *Proposed changes should be raised with the City PM for approval and the implications documented.*

#

# Regulations

* *Document and specify the relevant regulations that should be considered when developing the solution during the design process.*
* *E.g. Environment Act Licence No.3042 Clause 8, Clause 11 etc.*

#

# Design Consideration

* *Describe and specify the design criteria the design is intended to meet, i.e. level of service, design storms, minimum velocity and etc.*
	+ *The proposed design solution must not compromise the existing level of service. It also must not cause an increase in risk of basement flooding or an increase in spill detriment in combined sewer overflow locations.*
	+ *Model guidance basement flooding and overflow level of service requirements and RFP design requirements should be included at minimum.*
* *Identify design constraints.*
* *Confirm the conceptual solution is to be developed through Preliminary Design or document the rational to investigate alternative solutions.*
	+ *Changes to sizes or alignment where not significant should be communicated to the PM but does not further option appraisal.*
	+ *Justification for undertaking further option analysis should be provided to the City PM for approval before any changes are made.*
* *Where optioneering of alternative solutions was undertaken the approach solutions selection workshop and outcome should be documented and the solutions ranked.*
	+ *Any assumptions that need to be confirmed which could discount the proposed solution should be documented.*
	+ *Where a solution is found to not be hydraulically feasible or buildable, the next ranked solution should be taken forward.*
* *The design must consider the application of Green Infrastructure (GI) and Real Time Control (RTC).*
* *Provide design calculations used to size assets and validation documentation.*
* *For existing sewer sizing assessment and the proposed new sewer, sewers must be model represented and assessed, and validated using Rational Method. See appendix for example template table deliverable requirement.*
* *Where a Modified Rational Method is also proposed to be used, the rational and formula should be approved by the City PM.*

#

# Needs Assessment

* *See RFP requirements*
* *A table in appendix is recommended to present the performance comparisons for the scenarios listed in the following sub-sections.*
* *Complete the Business Case using the latest City of Winnipeg Business Case template.*
	+ *The latest version of the Business Case template can be found at http://citynet/finance/infrastructure/camp/default.stm#5*

## 2013 Baseline System Assessment

* *Provide a detailed assessment of the hydraulic condition of the district with the 2013 baseline hydraulic model network developed for the CSO Master Plan Preliminary Proposal.*
* *Provide maps and hydraulic section views / hydraulic grade line profiles in the appendices to illustrate the hydraulic condition. Refer to Section 5.5 of the Modelling Guidelines (City of Winnipeg, 2020) for the model submission requirements.*

## 20XX Current System Assessment

* *Provide a detailed assessment of the hydraulic condition of the district with the current or the best available representation of the sewer network condition for that specific year.*
* *Provide maps and hydraulic section views / hydraulic grade line profiles in the appendices to illustrate the hydraulic condition. Refer to Section 5.5 of the Modelling Guidelines (City of Winnipeg, 2020) for the model submission requirements.*
* *The current network is compared to the 2013 baseline network. Changes in basement flooding levels of service and CSO performance should be documented.*

## 20XX Future System Assessment

* *Provide a detailed assessment of the hydraulic condition of the district with the future projected populations, and levels of development. The future system is based on a 35-year design horizon.*
* *Provide maps and hydraulic section views / hydraulic grade line profiles in the appendices to illustrate the hydraulic condition. Refer to Section 5.5 of the Modelling Guidelines (City of Winnipeg, 2020) for the model submission requirements.*
* *The future network is compared to the current network. Changes in basement flooding levels of service and CSO performance should be documented.*

#

# Solution Development

* *See RFP requirements*
* *Describe the proposed solution and its feasibility. The solution must consider the application of green infrastructure and real time control.*
* *Provide design drawings of the proposed solution in the Appendix. The design drawings must meet the City of Winnipeg’s design standards.*
* *Design calculations for the solution components should be provided in appendix.*

## Control Option 1 Project Selection

* *This section is updated based on the proposed solution. Describe each of the solution control options components in the sub-sections.*
* *Any changes from the conceptual 2019 control option solution should be documented and rational for the changes should be provided in this section.*
* *Summarize the proposed solution to meet Control Option 1 – 85 Percent Capture in a Representative Year for the [district] sewer district in Table 8‑1. The proposed CSO control projects will include sewer separation, in-line storage with screening, and floatable management. Program enhancements including green infrastructure (GI) and real time control (RTC) will also be included as applicable.*
* *Describe marginal analysis considerations*
* *Discuss selected control options*
	+ *Other options considered but not pursued*
	+ *Rationale behind the proposed control options*
* *Identify issues specific to the district/control option selection*
* *List any unique district characteristics or modeling approach*

Table D. District Control Option

*Retain the format of the table. Update the content as required*

| Control Limit | Latent Storage | Flap Gate Control | Gravity Flow Control | Control Gate | In-line Storage | Off-line Storage | Storage / Transport Tunnel | Sewer Separation | Green Infrastructure | Real Time Control | Floatable Management |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 85 Percent Capture in a Representative Year | **-** | **-** | **-** | **✓** | **✓** | **-** | **-** | **✓** | **✓** | **✓** | **✓** |
| Notes:- = not included✓ = included |  |

*Use the Control Option Flow Chart as a guideline for order of presentation*

* *Was it a Priority Project*
* *Marginal analysis considerations*
* *Discuss selected control options (Keep consistent for every district plan)*
	+ *Other options considered but not pursued*
	+ *Why these control options were picked*
* *Identify issues specific to the district/control option selection*
* *List any unique district characteristics or modeling approach*
* *Be clear that all the control option projects are identified as proposed, and not finalized.*
	+ *BFR*
	+ *85 percent capture*
	+ *Future migration*

### Sewer Separation

* *The inclusion of this section depends on the proposed control solution, Remove if not applicable.*
* *Provide description of control*
	+ *Refer to district overview map or provide alternative map to illustrate the separation area.*
	+ *Identify if sewer separation is driven by BFR program and its scope*
	+ *Identify if sewer separation was selected to meet 85 percent capture goal*
* *List all assumptions and design considerations*
	+ *Approach to separation – road drainage only, foundation drainage remains in combined*
	+ *Impact on sanitary flow rates and pump stations*
	+ *Comment on utility and geotechnical information.*
	+ *Document the design checks and sizing methods and provide information in the appendix:*
		- *Minimum velocity checks.*
		- *Pipe flotation calculations.*
		- *The Rational method shall be used to size sewers and compared against model sewers to validate proposed sewer sizes.*
			* *The comparison tables as per the Appendix example shall be provided.*
			* *Where a modified version of the rational method is proposed to also be used the modified version required City PM approval and should be included in the comparison tables.*
* *Identify additional Pros and Cons*
	+ *Basement flooding relief*
	+ *Flood pumping stations*
	+ *Increased storage capacity*

### Latent Storage

* *The inclusion of this section depends on the proposed control solution, Remove if not applicable. Provide description of control.*
* *List all assumptions and design considerations*
	+ *Refer to standard details as required*
	+ *Describe latent pump station and force main*
		- *Ensure commentary is provided on why the latent pump station and force main is located as shown in the detail map for the latent storage.*
			* *Comment on the general logistics considerations for why the station was located where it is, impact in terms of land purchase and demolition of existing structures, and degree of traffic interruption in the area expected.*
			* *For the force main route shown, comment if the force main simply tied into the nearest CS manhole, or if other considerations were used to select conceptually where the force main will discharge into the CS system. Provide high level commentary on the level of construction activity and disruption in the area required for this force main route construction.*
			* *Where force mains are proposed, minimum, optimum and maximum velocity checks should be provided.*
	+ *Flap gate control assumptions*
		- *Chamber*
		- *Type of gate – standard details*
	+ *Comment on how the latent storage will function when the river level is below the flap gate invert*
	+ *Provide the latent storage design criteria in Table 8‑2.*

|  |
| --- |
| Table . Latent Storage Design Criteria*Retain the format of the table. Update the content as required.* |
| Item | Elevation/Dimension | Comment |
| Invert Elevation |  |  |
| NSWL |  |  |
| Trunk Diameter |  |  |
| Design Depth in Trunk |  |  |
| Maximum Storage Volume |  |  |
| Force main |  |  |
| Flap Gate Control |  |  |
| Lift Station |  |  |
| Nominal Dewatering Rate |  | *Based on 4 times ADWF rate* |
| RTC Operational Rate |  | *Based on 2 times nominal rate* |
| *Notes:m3 = cubic metre(s)NSWL = normal summer water levelRTC = real time control* |

* *Identify and describe location selection. Use figures for illustration.*
	+ *Describe extent of sewer impacted*
	+ *Describe existing chamber and proposed modifications*
	+ *Describe latent lift station location and force main routing*
	+ *Describe interconnection(s) to CS*

### In-Line Storage

* *The inclusion of this section depends on the proposed control solution, Remove if not applicable. Provide description of control.*
	+ *For use in districts with or without latent storage*
	+ *Requires control gate installation*
	+ *Gravity districts – without existing lift stations*
		- *Discharge must be controlled*
		- *Use of flow controller – see standard details*
* *Provide the design criteria for in-line storage in Table 8‑3*
* *List all assumptions and design considerations*
	+ *Describe gate type*
	+ *Refer to standard details*

Table F. In-Line Storage Design Criteria

*Retain the format of the table. Update the content as required.*

|  |  |  |
| --- | --- | --- |
| Item | Elevation/Dimension | Comment |
| Invert Elevation |  | *Specify invert locations within sewer network* |
| Trunk Diameter |  |  |
| Gate Height |  |  |
| Top of Gate Elevation |  |  |
| Bypass Weir Elevation |  |  |
| Maximum Storage Volume |  |  |
| Nominal Dewatering Rate |  | *Based on minimum pass forward rate due to existing gravity sewer and river siphon crossing / lift station* |
| RTC Operational Rate |  |  *Future RTC / dewatering review on performance, potentially based on 2 times nominal rate* |

* *Identify and describe location selection*
	+ *use figure(s) to illustrate the location and configuration of the control gate and screening chambers*
	+ *Describe extent of sewer impacted*
* *Describe Dewatering Impacts*

### Gravity Flow Control

* *The inclusion of this section depends on the proposed control solution, Remove if not applicable.*
* *Provide description of control*
* *Provide the gravity flow control design criteria in Table 8‑4.*

Table . Gravity Flow Control Design Criteria

*Retain the format of this table. Update the content as required.*

|  |  |  |
| --- | --- | --- |
| Item | Elevation/Dimension | Comment |
| Dewatering Rate |  |  |
| Dewatering Time |  |  |
| Secondary Sewer Size |  |  |

* *Identify and describe location selection*
	+ *Refer to district maps*
* *List all assumptions and design considerations*
	+ *Refer to standard details*

### Off-Line Storage

* *The inclusion of this section depends on the proposed control solution, Remove if not applicable.*
* *Provide description of control*
* *Provide the design criteria for the off-line storage in Table 8‑5.*

Table H. Off-Line Storage Design Criteria

*Retain the format of this table. Update the content as required.*

| Item | Elevation/Dimension | Comment |
| --- | --- | --- |
| Invert Elevation |  |  |
| Transfer Pump Sump Elevation |  |  |
| Transfer Pump Capacity |  |  |
| Ground Elevation |  |  |
| Top of Tank |  |  |
| Bottom of Tank |  |  |
| Tank Area |  |  |
| Storage Volume |  |  |
| Nominal Dewatering Rate |  | Based on 4 times ADWF rate |
| RTC Operational Rate |  | Based on 2 times nominal rate |

* *Identify and describe location selection*
	+ *Refer to district maps*
* *List all assumptions and design considerations*
	+ *Refer to standard details*
	+ *Near surface tank*
	+ *Requires large transfer pumps*
	+ *Consider use of existing flood pumping stations*
	+ *Dewatering pumps*
	+ *Location Selection (other options)*
	+ *Grit*
	+ *Odours*

### Tunnel Storage

* *The inclusion of this section depends on the proposed control solution, remove if not applicable.*
* *Provide description of control*
* *Identify the design criteria for tunnel storage in Table 8‑6.*

Table I. Tunnel Storage Design Criteria

*Retain the format of the table. Update the content as required*

|  |  |  |
| --- | --- | --- |
| Item | Elevation/Dimension | Comment |
| Number of Connections |  |  |
| Diameter |  |  |
| Length |  |  |
| Storage Volume |  |  |
| Nominal Dewatering Rate |  | Based on 4 times ADWF rate |
| RTC Operational Rate |  | Based on 2 times nominal rate |

* *Identify and describe location selection*
* *List all assumptions and design considerations*
	+ *Refer to standard details*
	+ *Fills and drains by gravity to lift station*
	+ *Identify grit and cleaning requirements*

### Floatables Management

* *The inclusion of this section depends on the proposed control solution, Remove if not applicable.*
* *Provide description of control*
* *Provide the design criteria for screening with gate control implemented in Table 8‑7.*

Table J. Floatables Management Design Criteria

*Retain the format of the table. Update the content as required.*

|  |  |  |
| --- | --- | --- |
| Item | Elevation/Dimension/Rate | Comment |
| Top of Gate |  |  |
| Bypass Weir Crest  |  |  |
| Normal Summer River Level |  |  |
| Maximum Screen Head |  |  |
| Peak Screening Rate |  |  |
| Screen Size |  |  |

* *Identify and describe location selection, use figures for illustration*
* *Identify screen selection*
	+ *Refer to standard details*
* *List all assumptions and design considerations*
	+ *Unique features – head available etc.*

### Green Infrastructure

* *A desktop assessment matrix of the district potential Green Infrastructure (GI) opportunities should be completed and contain but not be limited to the following minimum criteria:*
	+ *Land ownership*
	+ *Cost*
	+ *Volume reduction*
	+ *Maintenance requirements*
	+ *Operational requirements*
	+ *Additional benefits*
* *The initial assessment should be based on aerial maps and high scoring opportunities should be investigated in detail.*
* *The initial matrix should be scored at a workshop which include the City project team.*
* *Describe the application and location selection of GI as part of the control option.*
* *Describe how the proposed GI control is applicable to the City’s topography, climate and soil classification.*
* *Provide examples of past successful applications of the proposed GI within the City of Winnipeg, however where no Winnipeg examples exist, examples in Cities with similar climate should be used if available.*

### Real Time Control

* *Describe the application of Real Time Control (RTC) as part of the control option.At the planning level, the City uses population as proportion of the district DWF allowance relative to the treatment plant DWF treatment capacity for the treatment plant catchment. DWF pumping and/or gravity diversion control should consider the allowable DWF for the district.*
* *At the planning level, the City uses impermeable area as a proportion of the district wet weather flow allowance relative to the treatment plant wet weather flow treatment capacity for the treatment plant catchment. Wet weather flow pumping and/or gravity diversion control should consider the allowable wet weather flow from the district.*
* *Conflicts with design DWF (2.75DWF) and proportional DWF should be raised with the City. Minimum pass forward flow at downstream CSO cannot be exceeded in DWF therefore where upsizing or other system wide solutions are potentially required, the City PM should be consulted for direction.*
* *Provide description of control and the process to develop the solution.*
* *Provide the Real Time Control Identification and Decision Matrix per RFP requirements*
* *Describe the location selection and use figures for illustration*
* *Identify control selection*
* *List all assumptions and design considerations*
	+ *Unique features*

## System Operations and Maintenance

* *Appropriate, standardized terminology should be used for each control type.*
	+ *Reference to Control Gate operation in terms of the raised and lowered positions.*
* *Describe the district specific System O&M, including the operations and locations of the control option items.Future O&M considerations and impacts*
* *O&M High Level Considerations:*
	+ *Flap gate maintenance*
	+ *Dewatering pumps will require yearly maintenance and level control equipment calibration*
	+ *Debris and floatables cleaning racks will need to be emptied on a regular basis*
	+ *Loss of cleaning velocity in the trunk sewers for latent storage will result in debris deposition. The cleaning of trunk sewers is expensive and requires specialized equipment that the City does not currently have*

#

# Performance Assessment

## 20XX Current Solution System Assessment

* *Provide a detailed assessment of the hydraulic condition and impact of the district with the current or the best available representation of the sewer network condition for that specific year, with the proposed solution.*
* *Provide maps and hydraulic section views / hydraulic grade line profiles in the appendices to illustrate the hydraulic condition. Refer to Section 5.5 of the Modelling Guidelines (City of Winnipeg, 2020) for the model submission requirements*
* *Provide evidence to support the proposed solution and hydraulic impact:*
	+ *Demonstrate that the proposed solution will not compromise the existing level of service and it will align with the objective of meeting the CSO Master Plan’s Control Option1 performance target.*
		- *Include the detriment analysis in the appendix as described in the* *CoW Modeling GuidelinesRev1.0*
	+ *Provide sewer network maps with the proposed solution to illustrate the location, potential construction complexity and hydraulic impact*
* *Validate the proposed solution using the Rational Method and Modified Rational Method. Provide the calculation breakdown of the two methods and provide a table that summarizes the peak flow and velocity of each asset using the Rational Method, Modified Rational Method and the hydraulic model.*
* *The current solution network is compared to the current network. This is to ensure the solution works if implemented now.*
* *Provide drawings to illustrate the proposed solution*

## 20XX Future Solution System Assessment

* *Provide a detailed assessment of the hydraulic condition and the impact of the district with the future projected populations, and levels of development, with the proposed solution. The future system is based on a 35-year design horizon.*
* *Provide maps and hydraulic section views / hydraulic grade line profiles in the appendices to illustrate the hydraulic condition. Refer to Section 5.5 of the Modelling Guidelines (City of Winnipeg, 2020) for the model submission requirements*
* *Provide evidence to support the proposed solution and hydraulic impact:*
	+ *Demonstrate that the proposed solution will not compromise the existing level of service and it will align with the objective of meeting the CSO Master Plan’s Control Option1 performance target.*
		- Include the detriment analysis in the appendix as described in the *CoW Modeling GuidelinesRev1.0*
	+ *Provide sewer network maps with the proposed solution to illustrate the location, potential construction complexity and hydraulic impact*
* *Validate the proposed solution using the Rational Method and Modified Rational Method. Provide the calculation breakdown of the two methods and provide a table that summarizes the peak flow and velocity of each asset using the Rational Method, Modified Rational Method and the hydraulic model.*
* *The future solution network is compared to the future network. This is to ensure the solution will work in the future.*
* *If there is an increase in CSO for the future scenario (expected), the solution needs to be sized to address this volume and should be tested to ensure it does not cause detriment in the future solution scenario and the solution if built now would also work and not cause detriment by representing it in the current solution scenario and comparing to the current scenario.*
* *Provide drawings to illustrate the proposed solution.*

## Performance Summary

* *Summarize the modelled performance of the proposed control options to provide justification of selection.*
* *Provide the overflow volume performance estimate of the district with the proposed control options.*
* *Describe if the proposed control options from the 2019 Master Plan and Preliminary Design vary. If so, describe the changes and the impact to the performance estimate.*
* *Compare and summarize the model data of the 2013 Baseline model, 2037 Master Plan model, Current Year Preliminary Design model, and Future Year (based on a 35-year design horizon) Preliminary Design model in Table 9‑1.*
	+ *Note that the 2013 Baseline and 2037 Master Plan sewer system models were created and used to measure system performance during the Master Plan development. The 2013 Baseline model represents the sewer system baseline in the year 2013. The 2037 Master Plan – Control Option 1 model represents the future development with the proposed control options in the year of 2037.*
* *Provide the hydraulic model simulations’ performance results using the year-round 1992 representative year in Table 9‑2. The table states the results for the Baseline and, for each individual control option, for the proposed Preliminary Design Solution for Control Option 1. The Baseline and Control Option 1 performance numbers represent the comparison between the existing system and the proposed control options. The table also includes overflow volumes specific to each individual control option when simulations were completed; these are listed to provide an indication of benefit gained only and are independent volume reductions unless noted otherwise.*
* *Provide the CSO volume reduction breakdown based on the proposed contracts. The proposed solution should be broken into proposed contracts based on a logical sequence of the work and the contract by contract volume reduction should be documented in the appendix, see example table in Table 17‑1.*
* *Rational for the sequencing of the contracts should be documented.*
* *Additional benefits should be of individual contracts should be documented.*

Table . InfoWorks District Model Data

*Retain the format of the table. Update the content as required.*

| Model Version | Total Area (ha) | Contributing Area (ha) | Population | % Impervious | Control Options Included in Model |
| --- | --- | --- | --- | --- | --- |
| 2013 Baseline | *863* | *863* | *3,759* | *60* | *N/A* |
| 2037 Master Plan – Control Option 1 | *127* | *66* | *3,628* | *12* | *SEP etc.* |
| 20XX (Current Year) Preliminary Design– Control Option 1 |  |  |  |  |  |
| 20XX (Future Year) Preliminary Design– Control Option 1 |  |  |  |  |  |
| Notes:Total area is based on the model subcatchment boundaries for the district. |

Table . District Performance Summary – Control Option 1

*Retain the format of the table. Modify the control option from the table as required.*

|  |  |  |  |
| --- | --- | --- | --- |
| Control Option | Preliminary Proposal | 2019 Master Plan | Preliminary Design |
| Annual Overflow Volume(m3) | Annual Overflow Volume(m3) | Overflow Reduction(m3) | Number of Overflows | Pass Forward Flow at First Overflow (L/s) | Annual Overflow Volume(m3) | Overflow Reduction(m3) | Number of Overflows | Pass Forward Flow at First Overflow (L/s) |
| Baseline (2013) |  |  |  |  |  |  |  |  |  |
| Latent Storage |  |  |  |  |  |  |  |  |  |
| In-Line Storage |  |  |  |  |  |  |  |  |  |
| Off-Line Storage |  |  |  |  |  |  |  |  |  |
| Separation |  |  |  |  |  |  |  |  |  |
| **Preliminary Design Control Option 1** |  |  |  |  |  |  |  |  |  |

#

# Cost Estimates

* *Cost estimates were prepared during the development of the Preliminary Proposal and CSO Master Plan with a Class 5 planning level estimates with a level of accuracy of minus 50 percent to plus 100 percent. Based on the solution development from the Preliminary Design, an updated cost estimate is required.*
* *Provide a breakdown of the AACE Class 3 Capital Cost Estimate and a 35-year present value average annual operation and maintenance cost for solution recommended for Control Option No. 1.*
* *Provide the cost estimate for each control option determined in the Preliminary Proposal, Master Plan and Preliminary Design in Table 10‑1.*
* *Provide a breakdown of the AACE Class 3 Capital Cost Estimate based on the proposed contracts. The cost estimates should be documented in the appendix, see example table in Appendix.*
* *Complete the Basis of Estimate document using the latest version of the City of Winnipeg Basis of Estimate template.*
	+ *The latest version of the template can be found at http://citynet/finance/infrastructure/camp/default.stm#5*

Table . District Cost Estimate – Control Option 1

*Retain the format of the table and modify the control options from the table as required.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Control Option | 2014Preliminary ProposalCapital Cost | 2019CSO Master Plan Capital Cost | 2019 CSO Master PlanOperation and Maintenance  | Preliminary Design Capital Cost | Preliminary Design Operation and Maintenance Cost |
| Separation |  |  |  |  |  |
| Latent Storage |  |  |  |  |  |
| In-Line Storage  |  |  |  |  |  |
| Screens  |  |  |  |  |  |
| Flow Control |  |  |  |  |  |
| Off-line Storage |  |  |  |  |  |
| Tunnel Storage |  |  |  |  |  |
| **Subtotal** |  |  |  |  |  |
| Enhancements | N/A |  |  |  |  |
| **District Total** |  |  |  |  |  |

* *Describe how the cost estimates differ between the CSO Master Plan and the Preliminary Design. Identify factors that contribute to the change in cost estimate.*
* *Note that the calculations for the Master Plan cost estimate includes the following:*
	+ *Capital costs reported in terms of present value.*
	+ *A fixed allowance of 10 percent has been included for GI, with no additional cost for RTC.*
	+ *The Preliminary Proposal capital cost is in 2014-dollar values.*
	+ *The Master Plan capital cost is based on the control options presented in this plan and in 2019-dollar values.*
	+ *Future costs will be inflated to the year of construction.*
* *Present the changed items and differences identified between the CSO Master Plan and the Preliminary Design in Table 10‑2 Cost Estimate Tracking Table*

Table N.: Cost Estimate Tracking Table

*Retain the format of the table and update the content.*

|  |  |  |  |
| --- | --- | --- | --- |
| Changed Item | Change | Reason | Comments |
| Control Options  |  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Enhancements |  |  |  |
| Program Implementation Period |  |  |  |
| Basis of Estimates Update |  |  |  |
| Cost escalation from 2019 to Current Year |  |  |  |

#

# Meeting Future Performance Targets

* *Describe the approach to meeting the future performance target of 98 percent capture and potential target of 100 percent capture.*
* *The City requires an assessment of the changes to the solution and increased cost for upgrading Control Option 1 to 98 percent and 100 percent capture higher-level performance targets**. To understand the upgrades required to meet the future performance target of 98 percent capture and potential target of 100 percent capture for the representative year, a description of how the regulatory target adjustment could be met by building off the proposed work identified for Control Option 1 should be provided, and summarized in Table 11‑1. It should be raised with the City PM if an alternative solution to meet the 100 percent capture target is a modification or a phase approach, and if the approach would be significantly cost ineffective or potentially unfeasible. The impact and feasibility of the solution migration should be provided in the report. In circumstances where the Control Option 1 solution would become redundant, for instance, when a complete sewer separation is proposed or when a solution that will achieve 100 percent capture, commentary should be provided.*

Table Viable Migration Options from Control Option 1 to Meeting Future Performance Targets

*Retain the format of the table.*

|  |  |
| --- | --- |
| Upgrade Option | Viable Migration Options |
| 98 Percent Capture in a Representative Year |  |
| 100 Percent Capture in a Representative Year |  |

* *Provide a summary of the proposed control options required and state the capital cost estimates for each of the control options in Table 11‑2.*
* *Describe how the cost estimates vary between the control options.*

Table Preliminary Design Proposed Solution Capital Cost Estimates

*Retain the format of the table. Update the control option as required.*

|  |  |
| --- | --- |
| Control Option[Modify control options as required] | Preliminary Design Proposed Solution Capital Cost |
| Control Option 1(85 Percent Capture) | 98 Percent Capture | 100 Percent Capture |
| Separation |  |  |  |
| Latent Storage |  |  |  |
| In-Line Storage  |  |  |  |
| Screens  |  |  |  |
| Flow Control |  |  |  |
| Off-line Storage |  |  |  |
| Tunnel Storage |  |  |  |
| **Subtotal** |  |  |  |
| Enhancements |  |  |  |
| **District Total** |  |  |  |

* *Provide a summary of the impact to district*

#

# Risks and Opportunities

* *Provide an overview of the risks and opportunities identified, risks should be documented and managed over the course of the project and risk workshop with the City working group and consultant project team should be completed to assess risks post solution identification.*
* *Identify the high level risks and opportunities related to the district in Table 12‑1 based on the review of the district.*
* *A copy of the Risk Matrix should be provided in the Appendix.*
* *Complete the Risk Management Plan using the latest version of the City of Winnipeg Risk Management Plan template.*
	+ *The latest version of the template can be found at http://citynet/finance/infrastructure/camp/default.stm#5*

Table . Control Option 1 Significant Risks

*Retain the format of the table. Update the content, see below for example*

| Risk Number | Risk Component | Latent Storage | Flap Gate Control | In-line Control Gate | In-Line Storage | Off-line Storage | Storage / Transport Tunnel | Sewer Separation | Green Infrastructure | Real Time Control | Floatable Management |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Basement Flooding Protection | **-** | **R** | **R** | **-** | **-** | **O** | **O** | **-** | **-** | **-.**  |
| 2 | Lift Station | **O** | **-** | **-** | **R** | **O** | **-** | **-** | **-** | **R** | **-.** |
| 3 | Flood Pumping Station | **-** | **-** | **-** | **-** | **O** | **-** | **O** | **-** | **-** | **-.**  |
| 4 | Construction Disruption | **-** | **-** | **-** | **-** | **-** | **-** | **R** | **-** | **-** | **-.** |
| 5 | Implementation Schedule | **-** | **-** | **-** | **-** | **-** | **-** | **R** | **-** | **-** | **-.** |
| 6 | Sewer Condition | **-** | **-** | **-** | **R** | **-** | **-** | **-** | **-** | **-** | **-** |
| 7 | Sewer Conflicts | **-** | **-** | **-** | **-** | **-** | **-** | **R** | **-** | **-** | **-** |
| 8 | Program Cost | **-** | **-** | **-** | **-** | **-** | **-** | **R** | **-** | **-** | **O** |
| 9 | Approvals and Permits | **-** | **-** | **-** | **-** | **R** | **-** | **-** | **R** | **-** | **-** |
| 10 | Land Acquisition | **-** | **-** | **-** | **-** | **R** | **-** | **-** | **R** | **-** | **-** |
| 11 | Technology Assumptions | **-** | **R** | **O** | **-** | **-** | **-** | **-** | **O** | **O** | **R** |
| 12 | Operations and Maintenance | **-** | **R** | **R** | **R** | **-** | **-** | **-** | **R** | **-** | **R** |
| 13 | Volume Capture Performance | **-** | **-** | **-** | **R** | **-** | **-** | **-** | **O** | **O** | **-** |
| 14 | Treatment | **-** | **-** | **-** | **-** | **R** | **-** | **-** | **-** | **O** | **R** |
| Notes:R = Negative RiskO = Positive Risk |

*The component risk descriptions associated with the significant risks are presented in Table 12‑2.*

Table R. Component Risk Descriptions

*Retain the format of the table. Update the content, see below for example.*

| Risk Number | Negative Risk | Positive Risk |
| --- | --- | --- |
| 1. | * Gates fail closed
 | * Increase conveyance capacity
 |
| 2. | * In-line and RTC may require upsizing
 | * Latent and off-line may replace lift station pumps
 |
| 3. | * N/A
 | * FPS may be used in place of transfer pumps
 |
| 4. | * Sewer separation is disruptive to public
 | * N/A
 |
| 5. | * Separation is wide spread and costly – potential for delay
 | * N/A
 |
| 6. | * In-line storage may stress existing sewers, may require rehabilitation
 | * CSO will not replace existing sewers
 |
| 7. | * Construction in developed areas is more difficult
 | * N/A
 |
| 8. | * Sewer separation is difficult to estimate – potential for unknown conflicts
 | * Floatable Management could eliminate screening
 |
| 9. | * Projects affecting public / private may not be approved
 | * N/A
 |
| 10 | * Projects affecting public / private may not be approved
 | * N/A
 |
| 11 | * Gate / Screening not investigated in detail
 | * Gate automation, use of GI and RTC optimization
 |
| 12 | * More complex operation
* Increased Maintenance
 | * N/A
 |
| 13 | * Fewer CSOs may cause worse discharge water quality
 | * GI and RTC upgrades may enhance performance
 |
| 14 | * Increased solids and screenings to manage
 | * RTC could optimize flow rate and overall treatment
 |

## Risks

* *Describe all the potential risks associated with the specific solution recommended to meeting both Control Option No. 1 and future 98 percent and 100 percent control targets in detail and how they may have an impact on the CSO Master Plan.*

## Opportunities

* *Describe all the potential opportunities associated with the specific solution recommended to meeting both Control Option No. 1 and future 98 percent and 100 percent control targets in detail and how they may have an impact on the CSO Master Plan.*

#

# Hazard and Operability Assessment

* *A summary of the HAZOP assessment of the proposed solution.*
* *A copy of the assessment matrix table should be provided in the appendix.*
* *The type and location of the proposed solutions will determine the level of effort required for this section.*

#

# Stakeholders Communication

* *Summarize the stakeholder engagement plan.*
* *See RFP requirements.*
* *Complete the Stakeholder Assessment and Communication Plan using the latest version of the City of Winnipeg Stakeholder Assessment and Communication Plan template or City PM approved alternative template*
	+ *The latest version of the template can be found* [*on the City of Winnipeg webpage under the City Asset Management Program, under Project Management, Initiation and Planning at http://citynet/finance/infrastructure/camp/default.stm#5.*](file://\\ad.cityofwpg.org\wwddfs\groupdata\PROJECTS\Sewer\S-1201_Armstrong%20CSD%20PD\1.0%20Project%20Development\1.3%20Project%20Delivery%20Plan\1.3.2%20Report%20Template\on%20the%20City%20of%20Winnipeg%20webpage%20under%20the%20City%20Asset%20Management%20Program,%20under%20Project%20Management,%20Initiation%20and%20Planning%20at%20%20http:\citynet\finance\infrastructure\camp\default.stm#5.)

# Public Engagement

* *Summarize the public engagement plan.*
* *See RFP requirements.*
* *The level of proposed public participation should be justified:*
	+ *Information,*
	+ *Consultation,*
	+ *Involve,*
	+ *Collaborate, and*
	+ *Empower.*
* *Note with the CSO Master Plan, the public was engaged with the decision-making process on the level of control. This section should clearly identify if public engagement opportunities exist, if the public can shape or input into the proposed solution, and /or if there is little scope for public influence.*

#

# Conclusion and Recommendations

* *At minimum, provide an overview of the preliminary design solution with recommendations to meeting Control Option No 1, and the viable migration option to meeting future 98 percent and 100 percent control targets.*

#

# References

* *Include all related references*

Appendices

*Appendices must include but not limited to the following information if they are not already included in the main body of the document:*

* *Overview of Sewer District*
* *Data Collection and Assessment Technical Memorandum (including the Hydraulic Modelling TM)*
* *Business Case (Use City template)*
* *Sewer Network Map – Existing System (baseline, current and future networks)*
* *Hydraulic Condition – Existing System*
* *Sewer Network Map - Proposed System*
* *Hydraulic Condition – Proposed System*
* *Sewer Sizing Validation (see next page for minimum requirements)*
* *GI Opportunities and Decision Matrix*
* *RTC Opportunities and Decision Matrix*
* *Proposed Solution Design Drawings*
* *Cost Estimates Breakdown*
* *Basis of Estimate (Use City template)*
* *Risk Register*
* *Risk Management Plan (Use City template)*
* *Stakeholder Assessment and Communication Plan (Use City template)*

Appendix [X] – Sewer Sizing Validation

Appendix [X] – Proposed Contracts Breakdown

CSO Relief Work Contract Breakdown with Cost Estimates and CSO Volume Reduction Performance

|  |  |  |  |
| --- | --- | --- | --- |
| **Proposed Contract No.** | **Contract Description** | **Class 3 Estimate ($)** | **Estimated CSO Volume Reduction(m3)** |
| ***1*** | *Sewer separation and LDS construction at Harrow Street, Jackson Ave, Ebby Ave, Hector Av and Weatherdon Ave* | *30,0000* | *30,000* |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Note: The above contracts are presented in a sequential order at which work is expected to be performed.  |