



Water and Waste Department • Service des eaux et des déchets

City of Winnipeg

**Combined Sewer District Preliminary Design
Report Template**

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City of Winnipeg

City of Winnipeg Water and Waste Department

Combined Sewer District Preliminary Design Report Template

Document Title: Combined Sewer District Preliminary Design Report Template

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Wastewater Planning and Project Delivery Branch

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Document History and Status

Revision	Prepared by	Date	Reviewed by	Date	Approved by	Date
1.1	Tim Turzak	June 22, 2023	Modified by Tim Turzak for RFP Posting		N/A	

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.



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Executive Summary

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3.3.5 Asset Information

Table A. Sewer District Existing Asset Information

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			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			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 flow

N/A = not applicable

Table B. Critical Elevations Table

Reference Point	Item	Elevation (m) ^a
1	Normal Summer River Level	
2	Trunk Invert at Off-Take	
3	Top of Weir	
4	Relief Outfall Invert at Flap Gate	

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5	Low Relief Interconnection (Asset GIS ID)	
6	Sewer District Interconnection	
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Table C. District Status

District	Most Recent Study	Flow Monitoring	Hydraulic Model	Status	Expected Completion

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8.1 Control Option 1 Project Selection

Table D. District Control Option

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

8.1.1 Sewer Separation

8.1.2 Latent Storage

Table E. Latent Storage Design Criteria

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		
RTC Operational Rate		

8.1.3 In-Line Storage

Table F. In-Line Storage Design Criteria

Item	Elevation/Dimension	Comment
Invert Elevation		
Trunk Diameter		
Gate Height		
Top of Gate Elevation		

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Bypass Weir Elevation		
Maximum Storage Volume		
Nominal Dewatering Rate		
RTC Operational Rate		

8.1.4 Gravity Flow Control

Table G. Gravity Flow Control Design Criteria

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

8.1.5 Off-Line Storage

Table H. Off-Line Storage Design Criteria

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

8.1.6 Tunnel Storage

Table I. Tunnel Storage Design Criteria

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

8.1.7 Floatables Management

Table J. Floatables Management Design Criteria

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

8.1.8 Green Infrastructure

8.1.9 Real Time Control

8.2 System Operations and Maintenance

9. Performance Assessment

9.1 20XX Current Solution System Assessment

9.2 20XX Future Solution System Assessment

9.3 Performance Summary

Table K. InfoWorks District Model Data

Model Version	Total Area (ha)	Contributing Area (ha)	Population	% Impervious	Control Options Included in Model
2013 Baseline					
2037 Master Plan – Control Option 1					
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 L. District Performance Summary – Control Option 1

Control Option	Preliminary Proposal	2019 Master Plan				Preliminary Design			
	Annual Overflow Volume (m ³)	Annual Overflow Volume (m ³)	Overflow Reduction (m ³)	Number of Overflows	Pass Forward Flow at First Overflow (L/s)	Annual Overflow Volume (m ³)	Overflow Reduction (m ³)	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									

10. Cost Estimates

Table M. District Cost Estimate – Control Option 1

Control Option	2014 Preliminary Proposal Capital Cost	2019 CSO Master Plan Capital Cost	2019 CSO Master Plan Operation 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					

Table N.: Cost Estimate Tracking Table

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

11. Meeting Future Performance Targets

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

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

Table P Preliminary Design Proposed Solution Capital Cost Estimates

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			

12. Risks and Opportunities

Table Q. Control Option 1 Significant Risks

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

Notes:

- R = Negative Risk
- O = Positive Risk

Table R. Component Risk Descriptions

Risk Number	Negative Risk	Positive Risk
	•	•
	•	•
	•	•
	•	•
	•	•
	•	•
	•	•
	•	•
	•	•

12.1 Risks

12.2 Opportunities

13. Hazard and Operability Assessment

14. Stakeholders Communication

15. Heritage Resource Plan

16. Public Engagement

17. Conclusion and Recommendations

18. References

Appendices

Appendix – Sewer Sizing Validation

Appendix – 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)

Note: The above contracts are presented in a sequential order at which work is expected to be performed.