



APPENDICES

DESIGN AND CONSTRUCTION MANUAL

Vertical Municipal Infrastructure Standards



REVISION TRACKING

EXISTING VERSION	VERSION NUMBER
March 2019	N: V1 - Original Final Submission
December 2020	V2
May 2022	V3
January 2023	V4
March 2024	V5
March 2025	V6

2025 REVISION SUMMARY

SECTION	MODIFICATION & COMMENTARY
DWG WWPS-T1	<ul style="list-style-type: none"> -Removed Cleanout from Legend -Removed Float from Wet Well -Removed Cleanout from Wet Well
DWG WWPS-T2	<ul style="list-style-type: none"> -Removed Cleanout from Legend -Removed Float from Wet Well (Dual Cells) -Removed Cleanout from Wet Well (Dual Cells)
DWG WWPS-T3	<ul style="list-style-type: none"> -Removed Cleanout from Legend -Removed Float from Wet Well (Dual Cells) -Removed Cleanout from Wet Well (Dual Cells) -Removed Air Valve from Dry Pit Submersible Pumps
Approved Products List For Water Facilities-Gate Valve	<ul style="list-style-type: none"> -Clow Removed
Approved Products List For Water Facilities-Butterfly Valve	<ul style="list-style-type: none"> -Clow and Cla Val Removed
Approved Products List For Water Facilities-Centrifugal Pump-Horizontal Split Case	<ul style="list-style-type: none"> -Fairbanks Removed -Ruhrpumpen Added
Approved Products List For Water Facilities-Centrifugal Pump-Vertical inline	<ul style="list-style-type: none"> -Rotech Removed
Approved Products List For Water Facilities-Peristaltic Pump	<ul style="list-style-type: none"> -Cole-Palmer Removed

2025 REVISION SUMMARY

SECTION	MODIFICATION & COMMENTARY
Approved Products List For Water Facilities-Chlorine Residual Analyzer	-Rosemount Removed -Endress + Hauser Added
Approved Products List For Water Facilities-Flow Meters	-ABB Removed -Siemens Added
Approved Products List For Water Facilities-Pressure Transmitter	-ABB Removed -WIKA Removed -Siemens Added
Approved Products List For Water Facilities-Temperature Transmitter	-ABB Removed -Ashcroft Removed -Honeywell Removed -Siemens Added
Approved Products List For Water Facilities-Gearboxes	-Boston Gear Added -Rexnord Added
Approved Products List For Water Facilities-Packaged Standby Power Generators	-Sommers Added
Approved Products List For Water Facilities-Soft Starters	SECTION ADDED -Allen Bradley -ABB -Siemens
Approved Products List For Water Facilities-VFD	-ABB Removed -Siemens Removed

2025 REVISION SUMMARY

SECTION	MODIFICATION & COMMENTARY
Approved Products List For Waste Water Facilities-Knife Gate Valve	-Stainless steel construction and accessories -Resilient seat option
Approved Products List For Waste Water Facilities-Plug Valve	-Adjustable external limit stops -Position indicators -Epoxy coated or stainless steel body construction -Stainless steel accessories (internal)
Approved Products List For Waste Water Facilities-Flexible Disc Check Valve	-Epoxy coated or stainless-steel body construction -Stainless steel accessories (internal)
Approved Products List For Waste Water Facilities-Tilted Disk Valve	REMOVED
Approved Products List For Waste Water Facilities-Globe Style Valve	-Stainless steel construction and accessories
Approved Products List For Waste Water Facilities-Gate Valve	-Epoxy coated or stainless-steel body construction -Stainless steel accessories (internal) -Resilient seat option
Approved Products List For Waste Water Facilities-Sluice Gate	-Stainless steel construction and accessories -UHMW guides -EPDM seals
Approved Products List For Waste Water Facilities-Air Release	-Epoxy coated or stainless-steel body construction -Stainless steel accessories (internal)

2025 REVISION SUMMARY

SECTION	MODIFICATION & COMMENTARY
Approved Products List For Waste Water Facilities-Sewage Lift	<ul style="list-style-type: none"> -Hard iron/ stainless steel internals (shafts, impellers, wear rings, seal housing, hardware etc.) -Tungsten Carbide mechanical seals -Large solids passing capabilities
Approved Products List For Waste Water Facilities-Solids Handling	<ul style="list-style-type: none"> -Hard iron/ stainless steel internals (shafts, impellers, wear rings, seal housing, hardware etc.) -Tungsten Carbide mechanical seals -Large solids passing capabilities
Approved Products List For Waste Water Facilities-Chemical Metering Pumps	<ul style="list-style-type: none"> -Chemical Resistant -Diaphragm type metering -Local control panel/HMI -4-20ma or ethernet capabilities
Approved Products List For Waste Water Facilities-Dissolved Oxygen Probes	<ul style="list-style-type: none"> -Xylem Added
Approved Products List For Waste Water Facilities-Level Instruments	<ul style="list-style-type: none"> -Miltronics Removed -Siemens Added
Approved Products List For Waste Water Facilities-Submersible Pumps	<ul style="list-style-type: none"> -Gorman Rupp Removed -Crane/Barnes Added
Approved Products List For Waste Water Facilities-Standby Power Systems	<ul style="list-style-type: none"> -MTU Removed

APPENDICES
STANDARD DEVIATION FORM



DEVIATION REQUEST FORM

Design & Construction Manual

TO BE COMPLETED BY APPLICANT

To:	
From: (Applicant Name & Company)	
Phone:	
Email:	
Date:	
Re:	

Summary of Proposed Deviations from City of Brantford Design and Construction Manual Vertical Municipal Infrastructure Standards

Ref #	Type of Infrastructure	Related Brantford Standard Reference	Summary of Deviation Request / Brief Rationale	D.C.R.C.
1				
2				
3				

Revision Request Process:

1. All deviation requests are to be submitted to the City. The City will initiate review of the deviation request by relevant departments and inform the applicant of the tentative period of approval. Three (3) weeks will be provided to the City departments for review. Depending on the nature of the deviation request, the City's response may require additional review time.
2. Incomplete submissions (e.g. forms and drawings) of deviation request with insufficient supporting documentation will be returned to the applicant without review. The onus is on the applicant to provide a complete submission, which fully supports the deviation request.
3. The City will review the deviation request and advise the director for approval or refusal.
4. If the deviation request is accepted, the applicant will be provided with further instructions on how the change may be applied to the subject or pending works.
5. If the deviation request is rejected, the City will provide the applicant with reasons for the rejection. The applicant may elect to resubmit the deviation request, provided the City's reasons for initial rejection are fully addressed in the subsequent submission.



DEVIATION REQUEST FORM

Design & Construction Manual

TO BE COMPLETED BY APPLICANT

1. General Information			
Description of Work Undertaken			
Location of Work Completed		Project ID (if applicable)	
Location of Deviation in Design Submission		Contact Phone No.	
2. Reason / Justification for Deviation			
2.1. Background Information / Rationale for Deviation			
2.2. Potential Benefits of Deviation			
2.3. Potential Disadvantages of Deviation			
2.4. Information Gathered During the Deviation Review Process			



DEVIATION REQUEST FORM

Design & Construction Manual

FOR INTERNAL USE ONLY

3. Reviewers	
<input type="checkbox"/> Engineering Services <input type="checkbox"/> Environmental Services <input type="checkbox"/> Facilities & Asset Management	<input type="checkbox"/> Operational Services <input type="checkbox"/> Fleet & Transit Services <input type="checkbox"/> Development <input type="checkbox"/> Other
3.1. Comments	
3.2. Rationale for the Accept/Reject Decision	
3.3. Should the Existing Standard(s) Be Updated? Why?	

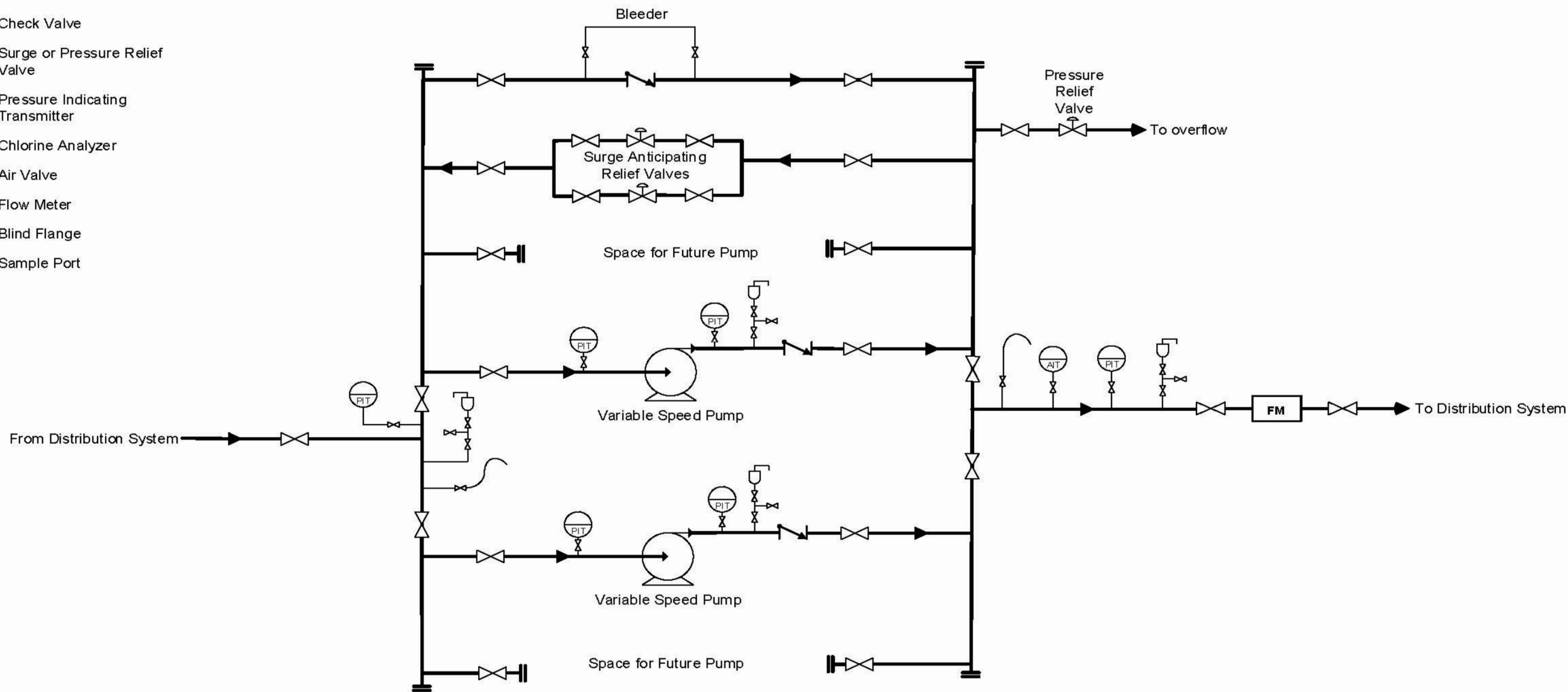
The changes above have been reviewed and accepted by the relevant stakeholders.

4. Acceptance			
Title	Name (Print)	Signature	Date (MM/DD/YYYY)
Manager			
Director			

APPENDICES
**PROPOSED DESIGN
STANDARD CHANGE FORM**

APPENDICES
**STANDARD SCHEMATICS
FOR PUMPING STATIONS**

- Legend:
- Pump
 - Manual Isolation Valve
 - Check Valve
 - Surge or Pressure Relief Valve
 - Pressure Indicating Transmitter
 - Chlorine Analyzer
 - Air Valve
 - Flow Meter
 - Blind Flange
 - Sample Port



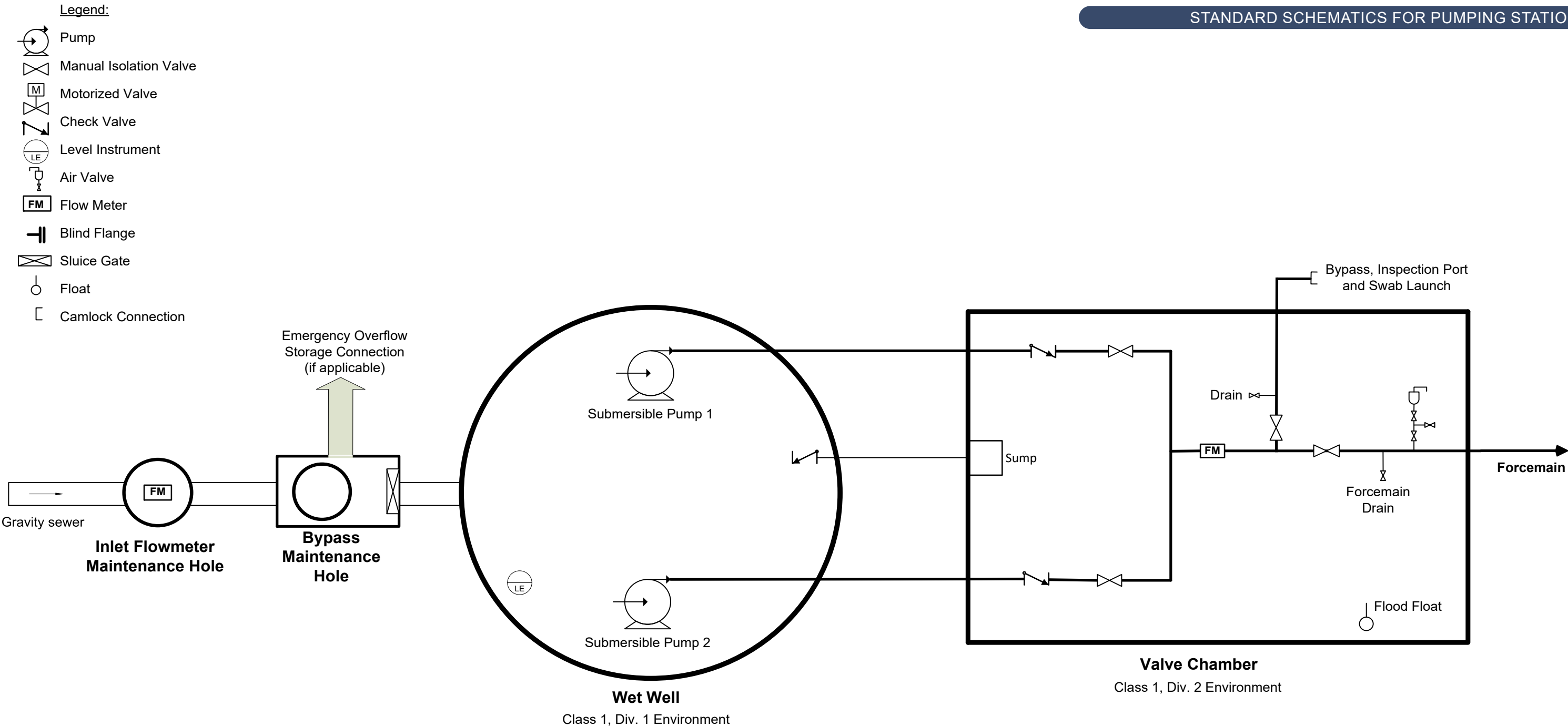
- Notes:
- This schematic should be read in conjunction with the Design and Construction Manual: Vertical Municipal Infrastructure Standards.
 - This schematic is intended to depict the general process flow and layout of the facility. It is not intended to depict a complete design.
 - This schematic shows two pumps with provisions for two future pumps for illustration purposes only. The Proponent is responsible for providing the required number of pumps to meet the design flow.
 - A vent and drain port (c/w ball valve) shall be included in each piping section between all isolation valves.




Design and Construction Manual
Vertical Municipal Infrastructure Standards

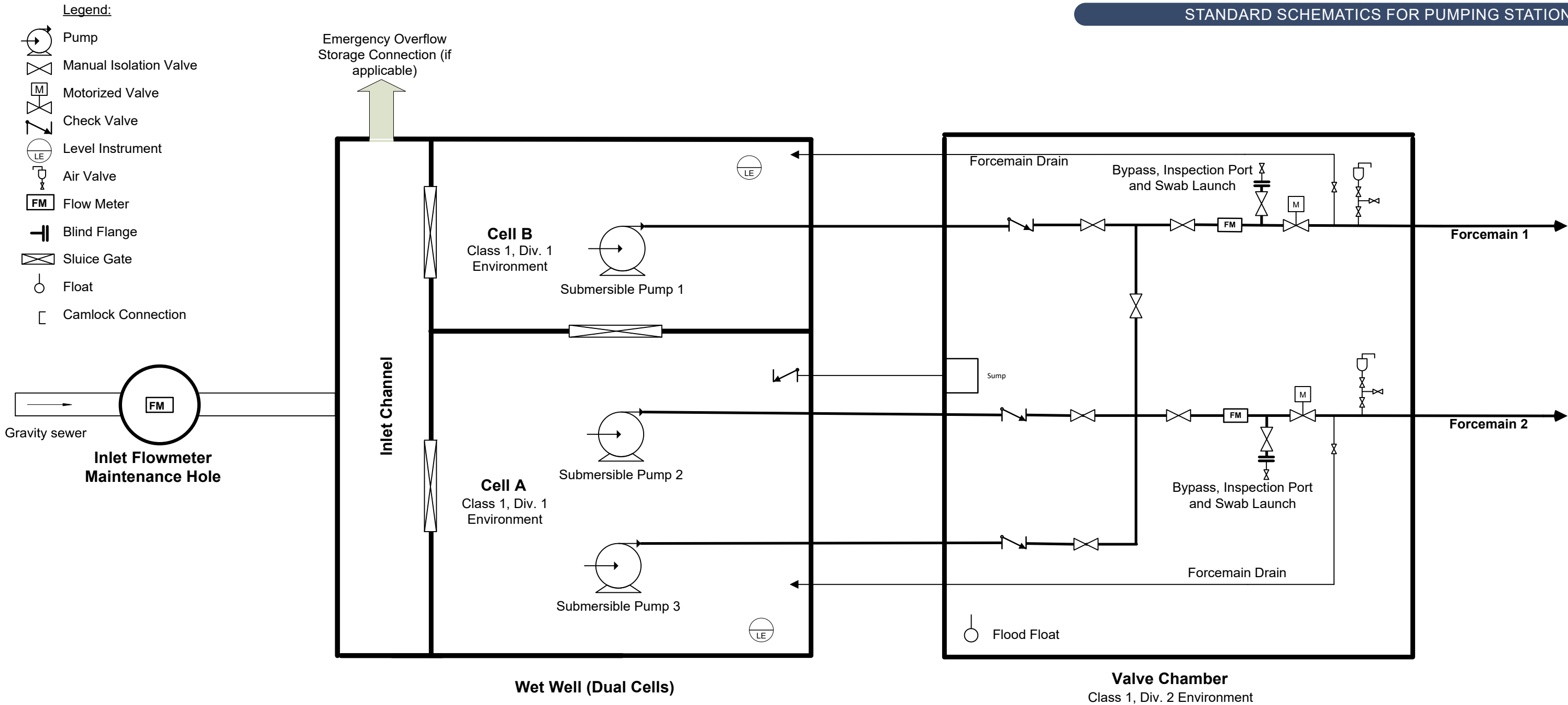
Water Booster Station

			DRAWING NUMBER:
			WBS-1
			SCALE:
			Not to Scale
0	ORIGINAL FINAL SUBMISSION	MAR-19	
NO.	REVISION	DATE	



- Notes:
1. This schematic should be read in conjunction with the Design and Construction Manual: Vertical Municipal Infrastructure Standards.
 2. This schematic is intended to depict the general process flow and layout of the facility. It is not intended to depict a complete design.

 Public Works Commission	Design and Construction Manual Vertical Municipal Infrastructure Standards		
	Wastewater Pumping Station – Type I (<76 L/s)		
			DRAWING NUMBER:
			WWPS-T1
1	March 2025	MAR-25	SCALE: Not to Scale
0	ORIGINAL FINAL SUBMISSION	MAR-19	
NO.	REVISION	DATE	



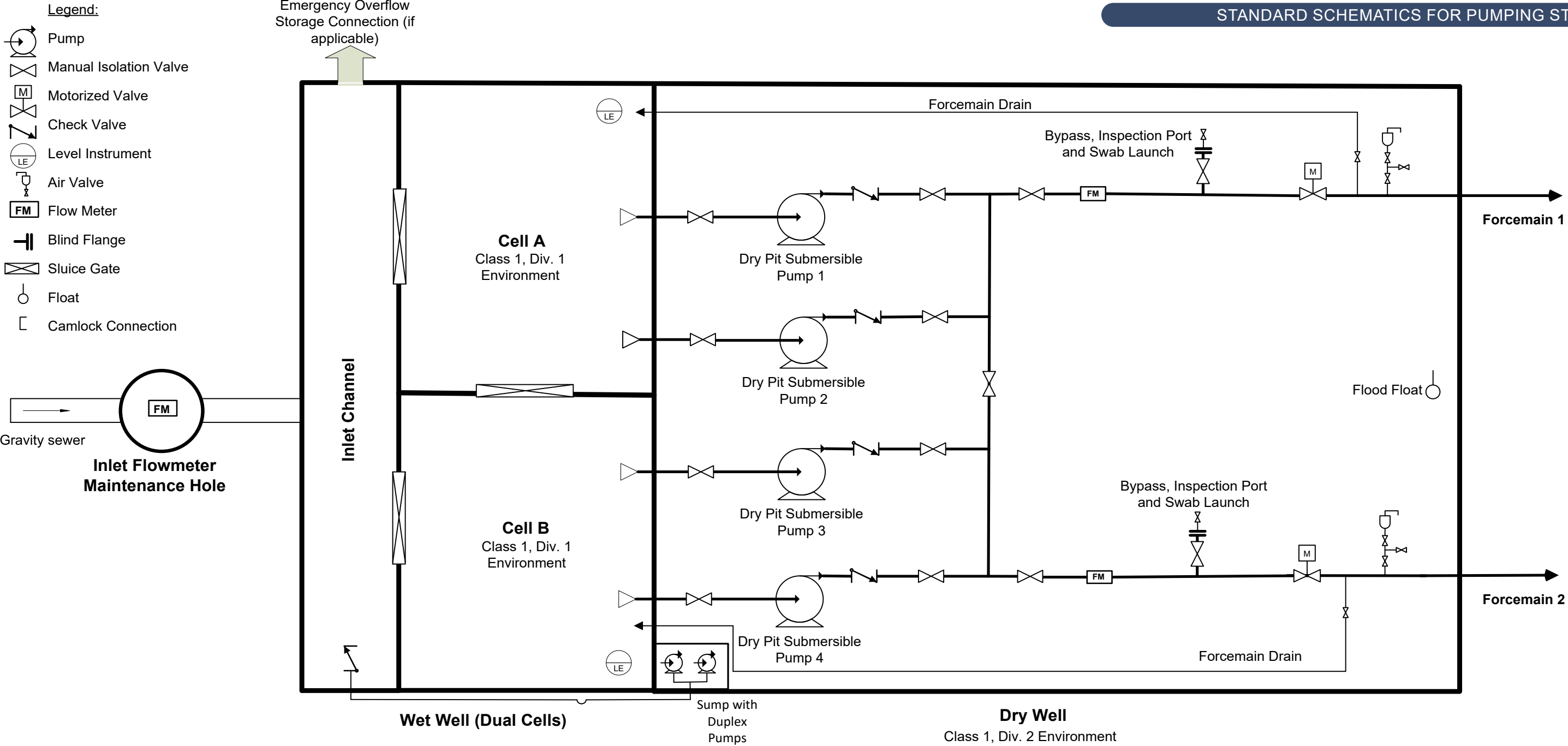
- Notes:
1. This schematic should be read in conjunction with the Design and Construction Manual: Vertical Municipal Infrastructure Standards.
 2. This schematic is intended to depict the general process flow and layout of the facility. It is not intended to depict a complete design.



Design and Construction Manual
Vertical Municipal Infrastructure Standards

Wastewater Pumping Station – Type II (76 to 119 L/s)

			DRAWING NUMBER: WWPS-T2
1	March 2025	MAR-25	
0	ORIGINAL FINAL SUBMISSION	MAR-19	SCALE:
NO.	REVISION	DATE	Not to Scale



- Notes:
1. This schematic should be read in conjunction with the Design and Construction Manual: Vertical Municipal Infrastructure Standards.
 2. This schematic is intended to depict the general process flow and layout of the facility. It is not intended to depict a complete design.



Design and Construction Manual
Vertical Municipal Infrastructure Standards

Wastewater Pumping Station – Type III (>120 L/s)

			DRAWING NUMBER: WWPS-T3
1	March 2025	MAR-25	
0	ORIGINAL FINAL SUBMISSION	MAR-19	SCALE:
NO.	REVISION	DATE	Not to Scale

APPENDICES
**APPROVED PRODUCTS LIST
FOR WATER FACILITIES**

Equipment Type	Brand Name	Comments
1. VALVES		
Elastomeric Check Valve	Cla Val	
	Tideflex	
Flexible Disc Check Valve	Cla Val	c/w backflow actuator
	Henry Pratt	
	Mueller	
	Val-Matic	
Tilted Disc Check Valve	Cla Val	opening and closing dash pot with speed control
	Henry Pratt	
	Val-Matic	
Globe Style Valve (Control, PRV, SRV, PSV)	Singer	SS accessories
	Cla Val	
Gate Valve (Resilient Seat)	Mueller	
	Henry Pratt	
	Val-Matic	
	AVK	
Sluice Gate	Dynamic	
	Fontaine-Aquanox	
	BNW	
	Orbinox	
Butterfly Valve	Henry Pratt	adjustable external limit stops
	Val-Matic	
	Mueller	
	DeZURIK	
Air Release / Vacuum	A.R.I.	
	Val-Matic	
	Cla Val	
Ball Valve and Electric Actuators (Chemical Application Only)	Chemline Plastics	
	Hayward	
	Rotork	
Ball Valve, SS (≤ 50 mm)	Pinnacle	
	Watts	
	Apollo	
Solenoid Valve	ASCO / Emerson	
	Burkert	
Valve Actuator - Electric	Auma	
	Limitorque	
	Rotork	
Eye Wash Station	Haws	c/w tempered water system
	Bradley	
Backflow Preventer	Watts	reduced pressure zone assembly

Equipment Type	Brand Name	Comments
2. PUMPS		
Centrifugal Pump - Horizontal Split Case	ITT Goulds / Xylem	
	Pentair / Aurora	
	Ruhrpumpen	
Centrifugal Pump - Vertical Inline	ITT Goulds	
	Grundfos	
	Pentair / Aurora	
Centrifugal Pump - End Suction (Rubber Lined)	Flowserve	
	ITT Goulds	
	KSB	
Centrifugal Pump - End Suction	ITT Goulds	
	Gorman Rupp	
	Grundfos	
	Pentair / Aurora	
Vertical Turbine Pump	RuhrPumpen	
	National PC	
	ITT Goulds / Xylem	
	Grundfos / Peerless	
3. CHEMICAL METERING PUMPS		
Peristaltic Pump	Blue-White	
	ProMinent	
	Pulsafeeder	
Progressive Cavity Pump	Moyno	
	SEEPEX	
Diaphragm Pump	Pulsafeeder	
	ProMinent	
	Encore / USGI Chemical Feed	
	Grundfos / Peerless	
4. INSTRUMENTATION EQUIPMENT		
Analytical Instruments		
Chlorine Residual Analyzer	Prominent	
	Endress + Hauser	
	Wallace & Tiernan	
Fluoride Analyzers	HACH	
	Siemens	
Chlorine Gas Monitoring (Fixed)	MSA	
	Siemens	
	ATI	
Ozone Gas Monitoring	Teledyne	
	Hach	
	BMT	
Turbidity Analyzer	HACH	

Equipment Type	Brand Name	Comments
Flow Instruments		
Flow Meters-Magnetic	Krohne	
	Endress + Hauser	
	Siemens	
Level Instruments		
Liquid Level Transmitter	Endress + Hauser	
	Rosemount	
	Siemens	
Pressure Instruments		
Pressure Transmitter	Allen Bradley	
	Endress + Hauser	
	Rosemount	
	Siemens	
Pressure Gauges	Ashcroft	dual scale, kPa/psi
	WIKA	
	Rosemount	
Temperature Instruments		
Temperature Transmitter	Allen Bradley	
	Endress + Hauser	
	Rosemount	
	Siemens	
The above equipment shall meet the following applicable standards: <ul style="list-style-type: none"> - All valves shall meet applicable AWWA standards - All equipment shall be certified by ANSI/NSF Standard 61 - All valves shall be equipped with internal and external fusion bonded epoxy coating (except SS body) - All equipment to be supplied with stainless steel hardware (nuts, bolts, washers) 		

Equipment Type	Brand Name	Comments
5. MISCELLANEOUS MECHANICAL		
Access Hatches	BILCO	c/w lift assist, hold open arm, pad lockable and secondary fall protection grating
	Halliday	
	MSU Mississauga	
Crane Systems	Konecranes	
	Richard-Wilcox	
Gearboxes	Boston Gear	
	Nord	
	Rexnord	
	SPX Flow / Lightning	
	SEW Eurodrive	
Submersible Pump	Xylem Flygt	
	Gorman Rupp	
	Grundfos	
6. RESIDUAL MANAGEMENT FACILITY		
Progressive Cavity - Rotor	Moyno	
	Seepex	
Knife Gate Valve	Trueline	bi-directional
	DeZURIK	
	Orbinox	
	Stafsjo	
Plug Valve	Val-Matic	
	Dezurik	
	Golden Anderson	
7. STANDBY POWER SYSTEMS		
Packaged Standby Power Generators	Toromont CAT	
	Cummins	
	Kohler	
	Sommers	
8. BLOWERS		
Lobe Blowers	Robuschi	
	SutorBilt	
	Gardner Denver	

Equipment Type	Brand Name	Comments
9. ELECTRICAL		
Soft Starters	Allen Bradley	
	ABB	
	Siemens	
VFD	Allen Bradley	
Automatic Transfer Switches	ASCO	
	Allen Bradley	
	Eaton / Cutler Hammer	
Motor Control Centre (MCC) / Panel Board	Allen Bradley	
	Eaton	
	Siemens	

APPENDICES
**APPROVED PRODUCTS LIST FOR
WASTEWATER FACILITIES**

Equipment Type	Brand Name	Comments
1. VALVES		
Knife Gate Valve	Trueline	Stainless steel construction and accessories Resilient seat option
	DeZURIK	
	Orbinox	
	Stafsjo	
Plug Valve	Val-Matic	Adjustable external limit stops
	Dezurik	Position indicators
	Golden Anderson	Epoxy coated or stainless stell body construction
		Stainless steel accessories (internal)
Elastomeric Check Valve (Duckbill)	Cla Val	
	Tideflex	
Flexible Disc Check Valve	Cla Val	Epoxy coated or stainless-steel body construction Stainless steel accessories (internal)
	Henry Pratt	
	Val-Matic	
Globe Style Valve (Control, PRV, SRV, PSV)	Singer	Stainless steel construction and accessories
	Cla Val	
Gate Valve (Resilient Seat)	Mueller	Epoxy coated or stainless-steel body construction Stainless steel accessories (internal) Resiliant seat option
	Henry Pratt	
	Val-Matic	
	Clow	
	AVK	
	Dynamic	
Sluice Gate	Fontaine-Aquanox	Stainless steel construction and accessories UHMW guides EPDM seals
	BNW	
	Orbinox	
	Henry Pratt	
Butterfly Valve	Val-Matic	Adjustable external limit stops
	Cla Val	
	Clow	
	Mueller	
	DeZURIK	
	A.R.I.	
Air Release / Vacuum	Val-Matic	Epoxy coated or stainless-steel body construction Stainless steel accessories (internal)
	Cla Val	
1. VALVES - CONT'D		
Ball Valve and Electric Actuators (Chemical Application Only)	Chemline Plastics	
	Hayward	
Ball Valve, SS (≤ 50 mm)	Pinnacle	
	Watts	
	Apollo	
Solenoid Valve	ASCO / Emerson	
	Burkert	
Valve Actuator - Electric	Auma	
	Limitorque	
	Rotork	
Eye Wash Station	Haws	c/w tempered water system
	Bradley	
Backflow Preventer	Watts	Reduced pressure zone assembly

Equipment Type	Brand Name	Comments
2. PUMPS		
Sewage Lift- Centrifugal Pump	Xylem/ Flygt	Hard iron/ stainless steel internals (shafts, impellers, wear rings, seal housing, hardware etc.) Tungsten Carbide mechanical seals Large solids passing capabilities
	KSB	
	Sulzer	
Solids Handling- Centrifugal Pump	Hidrostal	Hard iron/ stainless steel internals (shafts, impellers, wear rings, seal housing, hardware etc.) Tungsten Carbide mechanical seals Large solids passing capabilities
	Xylem/ Flygt	
	KSB	
Rotary Lobe- Positive Displacement Pump	Vogelsang	
Screw Pump- Positive Displacement Pump	Spanns Babcock	
	Lakeside Equipment	
3. CHEMICAL METERING PUMPS		
Diaphragm- Positive Displacement Pump	Pulsafeeder	Chemical Resistant Diaphragm type metering Local control panel/HMI 4-20ma or ethernet capabilities
	ProMinent	
	Encore / USGI Chemical Feed	
	Grundfos / Peerless	
4. INSTRUMENTATION EQUIPMENT		
Analytical Instruments		
Chlorine Analyzer/ Probe	Prominent	
	Rosemount / Emerson	
	HACH	
Sodium Bispluite Analyzer/ Probe	ProMinent	
	Rosemount/ Emerson	
	HACH	
Atmospheric Monitoring (Hazardous Areas- Fixed)	MSA	
	Siemens	
	ATI	
Disolved Oxygen Probes/ Analyzer	Xylem	
	HACH	
Flow Instruments		
Flow Meters-Magnetic/ Open Channel	Krohne	
	Endress + Hauser	
	Siemens/ Milltronics	
	ABB	
Level Instruments		
Liquid Level Transmitter	Rosemount	
	Siemens	

Equipment Type	Brand Name	Comments
Pressure Instruments		
Pressure Transmitter	Rosemount	
	E&H	
	ABB	
Pressure Gauges	Ashcroft	dual scale, kPa/psi
	WIKA	
	Rosemount	
Temperature Instruments		
Temperature Transmitter	Rosemount	
	Ashcroft	
	Honeywell	
	ABB	
The above equipment shall meet the following applicable standards:		
5. MISCELLANEOUS MECHANICAL		
Access Hatches	BILCO	c/w lift assist, hold open arm, pad lockable and secondary fall protection grating
	Halliday	
	MSU Mississauga	
Crane Systems	Konecranes	
	Richard-Wilcox	
Gearboxes	Nord	
	SPX Flow / Lightning	
	SEW Eurodrive	
Submersible Pump	Xylem Flygt	
	Crane/Barnes	
	Grundfos	

Equipment Type	Brand Name	Comments
6. STANDBY POWER SYSTEMS		
Packaged Standby Power Generators	Toromont CAT	
	Cummins	
	Kohler	
7. BLOWERS		
Lobe Blowers	Hibbon	
	SutorBilt	
	Gardner Denver	
8. ELECTRICAL		
VFD/ Soft Starters	Allen Bradley	
	Eaton	
	ABB	
Automatic Transfer Switches	ASCO / Emerson	
	Eaton/ Cutler Hammer	
9. MECHANICAL		
Clarifiers	Ovivo	
	Westech	
Mixers	Xylem/ Flygt	
	Sulzer	
	Ovivo	
Pre Treatment- Bar Screens, Compactors, Grit Separation	WTP	
	Maberex	
	Ovivo	