Winnipeg	**INSPECTION FORM** **TRANSFORMER, DRY TYPE, LOW VOLTAGE**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Transformer Data											
	KVA:	Phase:	Primary Voltage: V	Secondary Voltage: V							
	Manufacturer:		Type:	Serial Number:							
	Primary Winding: ☐ Δ ☐ YG ☐ Y ☐ Other:		Secondary Winding: ☐ Δ ☐ YG ☐ Y ☐ Other:								
	Winding Material: ☐ Copper ☐ Aluminum		Impedance: %Z	Temp Rise: °C	K Factor:						
	No Load Tap Changer	Tap	1	2	3	4	5				Tap Setting (As Found):
		Voltage									

Visual Inspection / Cleaning		
	Transformer Identification Tag Installed: ☐ Yes ☐ No	Visual Signs of Overheating: ☐ Yes ☐ No
	Bushings: ☐ Good ☐ Acceptable ☐ Poor	Support Insulators: ☐ Good ☐ Acceptable ☐ Poor
	Paint: ☐ Good ☐ Acceptable ☐ Poor	No Load Tap Changer: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Fans: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	Fan Controls: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Temp. Gauge: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	Connections: ☐ Good ☐ Acceptable ☐ Poor
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	Neutral Bonded to Ground: ☐ N/A ☐ Yes ☐ No
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Unit Cleaned: ☐ Yes Photograph Taken: ☐ Yes

Operational Inspection					
	Operational Conditions / Notes:				
	Primary Voltage:	H1:H2: V	H2:H3: V	H3:H1: V	Measured at:
	Secondary Voltage:	X1:__: V	X2:__: V	X3:__: V	Measured at:
	Current:	Ph A: A	Ph B: A	Ph C: A	Measured at:
	Tap Setting:	☐ Appears Satisfactory ☐ Further Monitoring Recommended. ☐ Recommend Changing Tap.		Tap Setting (As Left):	
	Thermographic Inspection Performed:	☐ Yes Attach report separately	Results: ☐ No Issues Found ☐ Potential Issue Identified.		

Insulation Resistance	**Winding**	**Test Voltage (Vdc)**	**Resistance (MΩ)**		**Dielectric Absorption Ratio 60s/30s**
			30 sec	**60 sec.**	
	Primary to Ground, Secondary Guarded				
	Secondary to Ground, Primary Guarded				
	Primary to Secondary, Ground Guarded				

Final Analysis				Comments:
	Returned to Service:	☐ Yes	☐ No	
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **CUSTOMER SERVICE TERMINATION END**	Page 1 of 2 Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

CSTE Location & Data	CSTE Downstream Load:		Equipment No.		Location:
	Drawings:	Single Line:	Grounding:		Site Plan:
	CSTE:	Manufacturer:	Model:		Serial #:
		Mounting Type: ☐ Floor ☐ Wall	Metering Type: ☐ CTs & PTs w/ Meter ☐ Meter Only		Remote Enclosure: ☐ Yes ☐ No
		Rated Current: A	Rated Voltage: VAC	Phases: ☐ 1-Ph ☐ 3-Ph	Short-Circuit Rating kAIC
	Main Disconnect Type:	☐ Breaker ☐ Switch ☐ N/A	Rating: A	Inst. Setting: A	Manufacturer: Model:

Service Size & CSTE Cabling	Service Size: kVA	Voltage: VAC Phases: ☐ 1Ø ☐ 3Ø	Rated Service Current: A	Service Transformer: ☐ Pole ☐ Padmount
	CSTE Load Side Cabling Size and Type: (ie 2 x 4C, 350 kcmil Teck90)		CSTE Load Side Cabling: ☐ Bottom ☐ Side / Rear	CSTE Downstream Load:
	CSTE Load Side Cable Rating: Table A (CEC C22.1) Diagram: Detail:			CSTE Ground Cable Size & Type:

Visual Inspection / Cleaning	CSTE Lamacoid Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No		
	Power Cables Labelled at Both Ends: ☐ Yes ☐ No		Phases Labelled Inside Enclosure: ☐ Yes ☐ No		
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor		Power Cable Connections: ☐ Good ☐ Acceptable ☐ Poor		
	Main Disconnect: ☐ Good ☐ Acceptable ☐ Poor		Service Entrance Enclosure: ☐ Good ☐ Acceptable ☐ Poor		
	Ground Connections: ☐ Good ☐ Acceptable ☐ Poor		Bus Bars and Insulators: ☐ Good ☐ Acceptable ☐ Poor		
	Door Mechanical: ☐ Good ☐ Acceptable ☐ Poor		Exercised Circuit Breaker / Disconnect: ☐ Yes ☐ No		
	Cables Supported Appropriately: ☐ Yes ☐ No		Equipment Cleaned: ☐ Yes	Photograph Taken: ☐ Yes	
	Comments:				

Resistance Measurements	**Test**	**Resistance (μΩ)**			**Test Summary**
		Phase A	**Phase B**	**Phase C**	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Interior Bus Bar / Cabling				
	Breaker / Disconnect				
	Comments:				

Winnipeg	**COMMISSIONING FORM** **CUSTOMER SERVICE TERMINATION END**	Page 2 of 2
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Insulation Resistance Test

Test Preparation:
Setup:
Source: ☐ Isolated
Contactor: ☐ Open

Cable Destination / Load:
☐ Disconnected
☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

WARNING: DISCONNECT ALL POWER CABLES FROM VFD MODULE AND CAPACITORS, AND DISCONNECT ALL CONTROL POWER FUSES PRIOR TO TEST.

Test	**Voltage**	**Insulation Resistance (MΩ)**			Ground all phases not under test!
		Phase A	**Phase B**	**Phase C**	
Interior Bus Bar / Cabling to Ground	1000 VDC				**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Main Disconnect Line to Ground	1000 VDC				
Main Disconnect Load to Ground	1000 VDC				
Main Disconnect Line to Load	1000 VDC				

Comments:

Breaker Settings

Adjust Settings to Match Single Line Diagram	Comments:
Settings Applied to Breaker: ☐ Yes ☐ No	
Single Line Diagram:	

Final Analysis

Returned to Service:	☐ Yes ☐ No	Comments:
Monitoring / Further Inspection Required:	☐ Yes ☐ No	
Repair / Replacement Required:	☐ Yes ☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM EMERGENCY LIGHTING**	Page 1 of 2 Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

Emergency Lighting Location & Data	Battery Bank Location:		Battery Bank Equipment No.	Panel Feed: Circuit No.	Control Panel No.	Applicable Drawings:
	Battery Bank:	Manufacturer:		Catalog No.		Serial #:
		Input Voltage: VAC	Output Voltage: VDC		Wattage: W	Internal Lamp Qty:
	Remote Fixtures:	Manufacturer:		Catalog No.		Remote Fixtures Qty:
		Input Voltage: VDC	Input Current: A		Lamp Wattage: W	Fixture Lamp Qty:
		Installed Locations:				

Visual Inspection / Cleaning	Identification Lamacoids Installed: ☐ Yes ☐ No		Lamps Properly Aimed: ☐ Yes ☐ No	
	Visual Signs of Moisture: ☐ Yes ☐ No		All Lamps Properly Operate: ☐ Yes ☐ No	
	Dry Well Remote Fixtures Moisture Proof Rated: ☐ Yes ☐ No ☐ N/A		Valve Chamber Remote Fixtures Moisture Proof Rated: ☐ Yes ☐ No ☐ N/A	
	Wet Well Remote Fixtures Explosion Proof Rated: ☐ Yes ☐ No ☐ N/A		Comminutor Chamber Remote Fixtures Explosion Proof Rated: ☐ Yes ☐ No ☐ N/A	
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor		Cable Connections: ☐ Good ☐ Acceptable ☐ Poor	
	Ground Connections: ☐ Good ☐ Acceptable ☐ Poor		Connections Properly Sealed: ☐ Good ☐ Acceptable ☐ Poor	
	Cables Supported Appropriately: ☐ Yes ☐ No		Equipment Cleaned: ☐ Yes	Photograph Taken: ☐ Yes
	Comments:			

Battery Testing	Battery Bank Temperature Before Starting Testing: °C	Battery Bank Temperature After Testing Completed: °C	**Test Summary** ☐ Test Passed ☐ Test Inconclusive ☐ Further Investigation Required ☐ Test Failed
	Battery Voltage at Start of Testing: V		
	Battery Backup Design Time (from Drawing): minutes minimum		
	Time Until All Emergency Lights Turn Off: minutes		
	Measured Battery Bank Current Draw During Testing: A		
	Time to Fully Recharge Battery After Testing: minutes		
	Comments:		

Operational Testing	Emergency Lights Turn On and Off Automatically in Normal Mode: ☐ Yes ☐ No		Emergency Lights Turn On in Test Mode: ☐ Yes ☐ No	
	Operating Modes	*Mode Description*	*Emergency Lights On*	*Time For Emergency Lights to Turn On*
		Normal Mode – Normal Station Operation	No	N/A
		Normal Mode – Battery Bank Power Supply Failure	☐ Yes ☐ No	sec
		Normal Mode – Individual Normal Lighting Circuits Fail	☐ Yes ☐ No	sec
		Test Mode	☐ Yes ☐ No ☐ N/A	sec
	Comments:			

Winnipeg	**COMMISSIONING FORM** **EMERGENCY LIGHTING**	Page 2 of 2
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

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Winnipeg	**COMMISSIONING FORM** **HVAC CONTROLLER**	Page 1 of 3 Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

Controller Location & Data	HVAC Controller Location:			Equipment No.			HVAC Control Panel Equip. No.	☐ N/A
	Drawings:	HVAC P&ID:		Control Panel:			Dampers Loop:	
	Controlled Dampers:	Supply Damper Equipment No.	☐ N/A	Return Damper Equipment No.	☐ N/A		Exhaust Damper Equipment No.	☐ N/A
	Controlled Heaters:	Heater No.	☐ N/A	Heater No.	☐ N/A		Heater No.	☐ N/A
	HVAC Controller:	Manufacturer:		Catalog No.			Serial #:	
		Power Rating:	Power Supply: VAC		Current Rating: A		Control Voltage: VAC	
	Control Power Transformer:	Size: VA	Secondary Voltage: V		Primary Fuse: A		Secondary Fuse: A	

Visual Inspection / Cleaning	HVAC Controller Lamacoid Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Power Cables Labelled at Both Ends: ☐ Yes ☐ No		Control Cables Labelled at Both Ends: ☐ Yes ☐ No	
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor		Power Cable Connections: ☐ Good ☐ Acceptable ☐ Poor	
	Fully Functioning Controller: ☐ Good ☐ Acceptable ☐ Poor		Controller Properly Mounted: ☐ Good ☐ Acceptable ☐ Poor	
	Controller Fully Programmed: ☐ Good ☐ Acceptable ☐ Poor		All Inputs & Outputs Work: ☐ Good ☐ Acceptable ☐ Poor	
	Cables Supported Appropriately: ☐ Yes ☐ No ☐ N/A		Equipment Cleaned: ☐ Yes	Photograph Taken: ☐ Yes
	Comments:			

Operational Testing	Station Occupied Light Switch Activates High Ventilation Rate: ☐ Yes ☐ No ☐ N/A		Comments:	
	High Outdoor Temperature Activates High Ventilation Rate: ☐ Yes ☐ No ☐ N/A			
	High Gas Detection Activates High Ventilation Rate: ☐ Yes ☐ No ☐ N/A			
	Controller Changes From High Ventilation Rate to Low Ventilation Rate: ☐ Yes ☐ No ☐ N/A			
	Controller Defaults to Low Ventilation Rate: ☐ Yes ☐ No ☐ N/A			

Operating Modes	*Mode Description*	*Supply Damper Open (0 – 100%)*	*Return Damper Open (0 – 100%)*	*Exhaust Damper Open (0 – 100%)*
	High Ventilation Rate	% ☐ N/A	% ☐ N/A	% ☐ N/A
	Low Ventilation Rate	% ☐ N/A	% ☐ N/A	% ☐ N/A

Controller Settings	Program HVAC Controller Settings to Match Setting Letter.	Comments:
	Settings Applied to Controller: ☐ Yes ☐ No	
	HVAC Controller Setting Letter File:	

Winnipeg	**COMMISSIONING FORM HVAC CONTROLLER**	Page 2 of 3
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Controller Input / Output Signals

Verify Control Signals Between Controller and Field Devices

Test Preparation: Test physical signals rather than installing jumpers for signals

Field Wires Labelled at Both Ends: ☐ Yes ☐ No

Comments:

Discrete 1 Input

Signal Description	*State*	*State Description*	*Signal Appears on Controller Screen*	*Modulated 1 Output (0 – 100 %)*	*Modulated 2 Output (0 – 100 %)*
☐ Not Used	Low (0)		☐ Yes ☐ No ☐ N/A	% ☐ N/A	% ☐ N/A
	High (1)		☐ Yes ☐ No ☐ N/A	% ☐ N/A	% ☐ N/A

Sensor A Input

Signal Description	*Signal Type*	*Condition Pickup Level*	*Signal Appears on Controller Screen*	*Modulated 1 Output (0 – 100 %)*	*Modulated 2 Output (0 – 100 %)*
☐ Not Used	☐ RTD ☐ PT100 ☐ PT1000 ☐ 4-20 mA	☐ Low ≤ °C	☐ Yes ☐ No ☐ N/A	% ☐ N/A	% ☐ N/A
		☐ High > °C	☐ Yes ☐ No ☐ N/A	% ☐ N/A	% ☐ N/A

Sensor B Input

Signal Description	*Signal Type*	*Condition Pickup Level*	*Signal Appears on Controller Screen*	*Modulated 1 Output (0 – 100 %)*	*Modulated 2 Output (0 – 100 %)*
☐ Not Used	☐ RTD ☐ PT100 ☐ PT1000	☐ Low ≤ °C	☐ Yes ☐ No ☐ N/A	% ☐ N/A	% ☐ N/A
		☐ High > °C	☐ Yes ☐ No ☐ N/A	% ☐ N/A	% ☐ N/A

Relay 1 Output

Signal Description	*Output Goes To*	*Output Changes Based on Signal Input*	*Output State Level*	*State Description*	*Signal Appears on Controller Screen*
☐ Not Used		☐ Discrete Input 1 ☐ Sensor A ☐ Sensor B	Low (0)		☐ Yes ☐ No ☐ N/A
			High (1)		☐ Yes ☐ No ☐ N/A

Relay 2 Output

Signal Description	*Output Goes To*	*Output Changes Based on Signal Input*	*Output State Level*	*State Description*	*Signal Appears on Controller Screen*
☐ Not Used		☐ Discrete Input 1 ☐ Sensor A ☐ Sensor B	Low (0)		☐ Yes ☐ No ☐ N/A
			High (1)		☐ Yes ☐ No ☐ N/A

Modulated 1 Output

Output Goes to Field Devices	*Output Signal*	*Output Changes Based on Signal Input*	*Output State Level*	*Signal Appears on Controller Screen*	*Measured Output (V / mA)*
☐ Heater SCR ☐ Supply Damper ☐ Return Damper ☐ Exhaust Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ 4–20mA	☐ Discrete Input 1 ☐ Sensor A ☐ Sensor B	Low	☐ Yes ☐ No ☐ N/A	V / mA
			High	☐ Yes ☐ No ☐ N/A	V / mA

Modulated 2 Output

Output Goes to Field Devices	*Output Signal*	*Output Changes Based on Signal Input*	*Output State Level*	*Signal Appears on Controller Screen*	*Measured Output (V / mA)*
☐ Heater SCR ☐ Supply Damper ☐ Return Damper ☐ Exhaust Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ 4–20mA	☐ Discrete Input 1 ☐ Sensor A ☐ Sensor B	Low	☐ Yes ☐ No ☐ N/A	V / mA
			High	☐ Yes ☐ No ☐ N/A	V / mA

Winnipeg	**COMMISSIONING FORM HVAC CONTROLLER**	Page 3 of 3
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **HVAC DAMPERS**	Page 1 of 3
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact		
	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

Damper Actuators Location & Data	Station Ventilation Room(s) / Area(s)		HVAC Controller Equipment No.		HVAC Control Panel Equip. No. ☐ N/A
	Drawings:	HVAC P&ID:	Control Panel:		Dampers Loop:
	Supply Damper Actuator:	Room Installed:	Equipment No.		Control Type: ☐ Modulating ☐ On / Off
		Manufacturer:	Catalog No.		Serial #:
		Power Supply: VAC / VDC	Torque:	Nm	Runtime: sec.
		Control Input: VAC / VDC	Control Output:	VAC / VDC	Auxiliary Switch Provided: ☐ Yes ☐ No
	Return Damper Actuator:	Room Installed:	Equipment No.		Type: ☐ Modulating ☐ On/Off
		Manufacturer:	Catalog No.		Serial #:
		Power Supply: VAC / VDC	Torque:	Nm	Runtime: sec.
		Control Input: VAC / VDC	Control Output:	VAC / VDC	Auxiliary Switch Provided: ☐ Yes ☐ No
	Exhaust Damper Actuator:	Room Installed:	Equipment No.		Type: ☐ Modulating ☐ On/Off
		Manufacturer:	Catalog No.		Serial #:
		Power Supply: VAC / VDC	Torque:	Nm	Runtime: sec.
		Control Input: VAC / VDC	Control Output:	VAC / VDC	Auxiliary Switch Provided: ☐ Yes ☐ No

Visual Inspection / Cleaning			
	HVAC Damper Lamacoids Installed: ☐ Yes ☐ No	HVAC Damper Actuator Lamacoids Installed: ☐ Yes ☐ No	
	Power Cables Labelled at Both Ends: ☐ Yes ☐ No	Control Cables Labelled at Both Ends: ☐ Yes ☐ No	
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor	Power Cable Connections: ☐ Good ☐ Acceptable ☐ Poor	
	Fully Functioning Actuators: ☐ Good ☐ Acceptable ☐ Poor	Actuators Properly Installed: ☐ Good ☐ Acceptable ☐ Poor	
	All Actuator Inputs Work: ☐ Good ☐ Acceptable ☐ Poor	All Actuator Outputs Work: ☐ Good ☐ Acceptable ☐ Poor	
	Cables Supported Appropriately: ☐ Yes ☐ No ☐ N/A	Equipment Cleaned: ☐ Yes	Photographs Taken: ☐ Yes
	Comments:		

Operational Testing					
	Supply Actuator Measured Opening Time: sec		Supply Actuator Measured Closing Time: sec		
	Return Actuator Measured Opening Time: sec		Return Actuator Measured Closing Time: sec		
	Exhaust Actuator Measured Opening Time: sec		Exhaust Actuator Measured Closing Time: sec		
	Supply Damper Changes From Low Ventilation to High Ventilation: ☐ Yes ☐ No		Supply Damper Changes From High Ventilation to Low Ventilation: ☐ Yes ☐ No		
	Return Damper Changes From Low Ventilation to High Ventilation: ☐ Yes ☐ No		Return Damper Changes From High Ventilation to Low Ventilation: ☐ Yes ☐ No		
	Exhaust Damper Changes From Low Ventilation to High Ventilation: ☐ Yes ☐ No		Exhaust Damper Changes From High Ventilation to Low Ventilation: ☐ Yes ☐ No		
	Operating Modes	*Mode Description*	*Fail-Safe Position*	*Low Ventilation Rate*	*High Ventilation Rate*
		Supply Damper Open Position	☐ Opened ☐ Closed	%	%
		Return Damper Open Position	☐ Opened ☐ Closed	%	%
		Exhaust Damper Open Position	☐ Opened ☐ Closed	%	%
	Comments:				

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Damper Actuator Settings

Adjust Damper Actuator Settings for Damper Balancing

Damper Settings Applied to: ☐ Supply Damper ☐ Return Damper ☐ Exhaust Damper

Comments:

	Direction Control	Angle of Rotation Positions	Auxiliary Switch Position
Supply Damper Actuator	☐ CCW ☐ CCW	Starting: Ending:	☐ Not Used
Return Damper Actuator	☐ CCW ☐ CCW	Starting: Ending:	☐ Not Used
Exhaust Damper Actuator	☐ CCW ☐ CCW	Starting: Ending:	☐ Not Used

Actuator Input / Output Control Signals

Verify Control Signals Between HVAC Controller and Dampers

Test Preparation: Test physical signals rather than installing jumpers for signals

Field Wires Labelled at Both Ends: ☐ Yes ☐ No

Comments:

Low Ventilation Rate

Actuator	*Signal Type*	*Measured Input Voltage*	*Measured Output Voltage*	*Output Received at PLC Card*	*Signal Appears on HMI Screen*	*SCADA Can See Signal*
Supply Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ On / Off	VDC	VDC	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Return Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ On / Off	VDC	VDC	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Exhaust Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ On / Off	VDC	VDC	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

High Ventilation Rate

Actuator	*Signal Type*	*Measured Input Voltage*	*Measured Output Voltage*	*Output Received at PLC Card*	*Signal Appears on HMI Screen*	*SCADA Can See Signal*
Supply Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ On / Off	VDC	VDC	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Return Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ On / Off	VDC	VDC	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Exhaust Damper ☐ Not Used	☐ 0 – 5V ☐ 0 – 10V ☐ On / Off	VDC	VDC	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

Final Analysis

Returned to Service:	☐ Yes	☐ No
Monitoring / Further Inspection Required:	☐ Yes	☐ No
Repair / Replacement Required:	☐ Yes	☐ No

Comments:

Winnipeg	**COMMISSIONING FORM** **HVAC DAMPERS**	Page 3 of 3
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSTRUMENTATION SWITCH CHECKLIST**	Page 1 of 1

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

Instrument		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:

Inspection Checklist			
No.	**Item to be Inspected**	**Comments**	**Pass (P/F)**
1.	Instrument type and class per P&ID and specification		
2.	Instrument tag(s) installed and correct		
3.	Installation of sensor complete and correct		
4.	Block and drain valves		
5.	Pneumatic / hydraulic tubing leak tested		
6.	Heat tracing / insulation / instrument housing		
7.	Wiring correct		
8.	Drawings marked up as-built		
9.	HMI Graphic symbol and tag correct		

State Checklist					
State	**State Desc**	**PLC Input**	**Local HMI**	**SCADA**	**Alarm**	**Pass (P/F)**
0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
1		☐	☐	☐	☐ On ☐ Off	

Calibration					
Transition	**Setpoint Trip Point** (incl. units)	**Actual Trip Point** (incl. units)	**Setpoint Time Delay**	**Actual Time Delay**	**Pass (P/F)**
0 → 1					
1 → 0					

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**INSTRUMENTATION TRANSMITTER LOOP CHECKLIST**	Page 1 of 2

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

Instrument (Sensor / Element)		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:

Transmitter		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:
Units:	Design Range: -	
Output ☐ 4-20 mA ☐ 0-10 V ☐ Modbus ☐ Ethernet IP ☐ Other:		

Inspection Checklist			
No.	**Item to be Inspected**	**Comments**	**Pass (P/F)**
1.	Instrument type and class per P&ID and specification		
2.	Instrument tag(s) installed and correct		
3.	Installation of sensor complete and correct		
4.	Block and drain valves		
5.	Pneumatic / hydraulic tubing leak tested		
6.	Heat tracing / insulation / instrument housing		
7.	Impulse lines pressure tested		
8.	Wiring correct		
9.	Drawings marked up as-built		
10.	HMI Graphic symbol, tag and units correct		

Signal Validation					
Input Signal	**Location**	**Design Value**	**Actual Value**	**Error (%)**	**Pass (P/F)**
	Transmitter Display				
	Transmitter Output				
	Process Display				
	PLC				
	HMI				
	Transmitter Display				
	Transmitter Output				
	Process Display				
	PLC				
	HMI				
	Transmitter Display				
	Transmitter Output				
	Process Display				
	PLC				
	HMI				

Notes:
1. Attach factory calbration forms for all instruments where provided and/or specified.
2. Provide instrument parameters for each parameter changed from the factory default.

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**INSPECTION FORM** **MCC, 600V**	Page 1 of 6 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

MCC Data				
	Location:			# of Cells:
	Manufacturer:	Model:	Serial #:	
	Rated Voltage: V	Main Bus Rating: A	Main Bus Neutral Rating: A	
	Bus Conductor: ☐ Copper ☐ Aluminum	Current Withstand Rating: A		

Visual Inspection / Cleaning				
	Identification Tag Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Visual Signs of Moisture: ☐ Yes ☐ No		Visual Signs of Corona: ☐ Yes ☐ No	
	Fuse/Breaker Sizes Match Drawings: ☐ Yes ☐ No		PT and CT ratios match drawings: ☐ N/A ☐ Yes ☐ No	
	Elevation Drawings Correct: ☐ Yes ☐ No		Cables Supported Appropriately: ☐ Yes ☐ No	
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor		Insulators Condition: ☐ Good ☐ Acceptable ☐ Poor	
	Connections: ☐ Good ☐ Acceptable ☐ Poor		Electro/Mechanical Interlock System: ☐ Good ☐ Acceptable ☐ Poor	
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor		Vents/Filters: ☐ Good ☐ Acceptable ☐ Poor	
	Doors Mechanical: ☐ Good ☐ Acceptable ☐ Poor		Exercise Active Components: ☐ Yes ☐ No	
	Cell Fit and Alignment: ☐ Good ☐ Acceptable ☐ Poor			
	Required Clearances are Met: ☐ Good ☐ Acceptable ☐ Poor			
	Indicating mechanisms: ☐ Good ☐ Acceptable ☐ Poor		Unit Cleaned: ☐ Yes	Photograph Taken: ☐ Yes
	Comments:			

Incoming Power	**Type:**	**Inspection**				
	☐ Main Breaker	Complete appropriate breaker inspection form.				
	☐ Disconnect	Complete appropriate disconnect inspection form.				
	☐ Main Lugs	Visual Inspection: ☐ Good ☐ Acceptable ☐ Poor				
		Connections Torqued: ☐ Yes				
		Connection Resistance (μΩ) As Left	**A**	**B**	**C**	**N**

Insulation Resistance Test (Buswork)

Test Preparation:
Source:
☐ Disconnected
☐ Connected with Source Isolated

Cable Dest. / Load:
☐ Disconnected
☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

Temperature: °C

Test Voltage (dc)	Insulation Resistance (MΩ) Phase To Phase		
	A - B	B - C	C - A
1000 V			

Test Voltage	Insulation Resistance (MΩ) Phase To GND		
	A - GND	B - GND	C - GND
1000 V			

Test Summary

☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Comments:

Ground Resistance Checks (Ductor Test)

Point A	Point B	Resistance (μΩ)
MCC GND Bus	Facility Ground Electrode	
MCC GND Bus	MCC Enclosure	
MCC GND Bus	System Neutral	

Test Summary

☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Comments:

Feeder Breakers

Visual Inspect Requirements: G=Good, A=Acceptable, P=Poor Comments are required for all items identified in Poor condition.

1. Confirm identification tag / lamacoid is installed.
2. Look for visual signs of overheating.
3. Inspect and torque connections.
4. Inspect and test any electro/mechanical interlocks.
5. Confirm disconnect operation.
6. Check door mechanical condition.
7. Exercise circuit breaker.
8. Confirm cables are supported and routed appropriately.
9. Visually assess the general condition of the installation.

Note: Complete an appropriate Breaker Inspection Form for all breakers with separate adjustable Long and Short trip settings, Ground trip settings, or > 250A frame size.

Continued on next page

Continued from previous page

	ID	Loc./ Cell	Frame Rating (A)	Trip Rating (A)	Manuf.	Model	Trip Unit Type	Inst Setting	Visual Inspection	Cleaned	Comments
Feeder Breakers										☐	
										☐	
										☐	
										☐	
										☐	
										☐	
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										☐	
										☐	
	General Comments:										

Motor Starters / Contactors

Overcurrent Protection Type:	B=Breaker (Thermal Magnetic), M=Motor Circuit Protector, F=Fuse
Overload Protection Type:	T=Thermal, SS=Solid State, I=Intelligent
Visual Inspect Requirements:	G=Good, A=Acceptable, P=Poor Comments are required for all items identified in Poor condition.
1.	Confirm identification tag / lamacoid is installed.
2.	Look for visual signs of overheating.
3.	Inspect and torque connections.
4.	Inspect and test any electro/mechanical interlocks.
5.	Confirm disconnect operation.
6.	Check door mechanical condition.
7.	Exercise circuit breaker.
8.	Confirm cables are supported and routed appropriately.
9.	Visually assess the general condition of the installation.
Note:	Complete a Motor Starter Inspection Form for all Motor Starters Size 4 or larger, with VFDs, or with Soft Starters.

Motor Starters / Contactors

ID	Loc./ Cell	Overcurrent Protection				Contactor	Overload		Visual Insp.	Cleaned	Comments
		Type	Rating (A)	Manuf.	Model	Size / Rating	Type	Model			
										☐	
										☐	
										☐	
										☐	
										☐	
										☐	
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										☐	
										☐	
										☐	
										☐	
General Comments:											

Winnipeg	INSPECTION FORM MCC, 600V	Page 5 of 6 ID:

	ID	Loc./ Cell	Overcurrent Protection				Contactor	Overload		Visual Insp.	Cleaned	Comments
			Type	Rating (A)	Manuf.	Model	Size / Rating	Type	Model			
Motor Starters											☐	
											☐	
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	General Comments:											

Final Analysis				Comments:
	Returned to Service:	☐ Yes	☐ No	
	Monitoring / Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **MOLDED CASE CIRCUIT BREAKER, < 1000V**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Breaker Data			
	Location:	Panelboard/MCC:	Cell #:
	Manufacturer:	Type:	Serial #:
	Rated Voltage: V	Frame Size: A	Trip Unit:
	Interrupting Rating: kA	Comments:	

Visual Inspection / Cleaning		
	Breaker Identification Tag Installed: ☐ Yes ☐ No	Visual Signs of Overheating: ☐ Yes ☐ No
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Cables Supported Appropriately: ☐ Yes ☐ No
	Connections: ☐ Good ☐ Acceptable ☐ Poor	Electro/Mechanical Interlock: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	Exercise Circuit Breaker: ☐ Yes
	Door Mechanical: ☐ Good ☐ Acceptable ☐ Poor	Other:
	Comments:	

Breaker Settings

Trip Unit Rating: A — Trip Unit Type: ☐ None ☐ Thermal Magnetic ☐ Electronic ☐ LI ☐ LSI ☐ LSIG

Breaker Setting (As Left)		**Range**	**Setpoint**	**Delay**	**I^2T**
Long Time	☐ Fixed ☐ Adj.	-	X A = A	sec	☐ On ☐ Off
Short Time	☐ Fixed ☐ Adj.	-	X A = A	sec	☐ On ☐ Off
Instantaneous	☐ Fixed ☐ Adj.	-	X A = A	N/A	
Ground Fault	☐ Fixed ☐ Adj.	-	A	sec	☐ On ☐ Off

Insulation Resistance Test

Perform insulation resistance measurements for breakers >= 250A, or as specified.

Temperature: °C

Source: ☐ Disconnected ☐ Connected (Source Isolated)

Load: ☐ Disconnected ☐ Connected (Load Isolated)

Approval is required, prior to leaving cables connected during the test.

Test Voltage (VDC)	**Insulation Resistance (MΩ)**								
	Phase To GND (Breaker Closed)			**Phase To Phase (Breaker Closed)**			**Line to Load (Breaker Open)**		
	A	**B**	**C**	**A – B**	**B – C**	**A - C**	**A**	**B**	**C**

Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed

Comments:

Contact Resistance

Perform contact measurements for breakers >= 250A, or as specified.

Resistance (μΩ)	**A**	**B**	**C**

Comments:

Test Summary
☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**MODULATING CONTROL DEVICE CHECKLIST**	Page 1 of 1

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

Control Device		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:

Inspection Checklist			
No.	**Item to be Inspected**	**Comments**	**Pass (P/F)**
1.	Actuator type and class per P&ID and specification		
2.	Instrument tag(s) installed and correct		
3.	Installation of actuator complete and correct		
4.	Wiring correct		
5.	Drawings marked up as-built		
6.	HMI graphic symbol, tag and units correct		

Control Validation					
Control Output	**Location**	**Design Value**	**Actual Value**	**Error (%)**	**Pass (P/F)**
0%	**PLC Output**				
	Field Device				
50%	**PLC Output**				
	Field Device				
100%	**PLC Output**				
	Field Device				

Notes:
1. Attach factory calbration forms for all instruments where provided and/or specified.
2. Provide instrument parameters for each parameter changed from the factory default.

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**INSPECTION FORM** **MOTOR STARTER, FVNR, 600V**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Starter Data						
	Load:		Starter Location:			Cell #:
	Manufacturer:	Type:			Serial #:	
	Size:	Rated Voltage: V		Current Rating: A		Control Voltage: V
	Circuit Protection:	☐ Fused Disc.	Rating: A	Fuse Size: A	Fuse Mfg.	
					Model:	
		☐ Breaker ☐ MCP	Rating: A	Inst. Setting: A	Manufacturer:	
					Model:	
	Overload Protection:	☐ Thermal ☐ Electronic ☐ Intelligent	Class: ☐ 10 ☐ 20 ☐ 30 ☐ Unknown	Setting / Rating: A	Manufacturer:	
					Model:	
	Control Power Transformer:	Size: VA	Sec. Voltage: V	Primary Fuse: A	Secondary Fuse: A	
	Current Transformers:	Phases: ☐ A ☐ B ☐ C ☐ None	Ratio:	Ground Fault CT:	☐ Present ☐ Not Present	Ratio:

Motor Data			
	ID:	Size: kW / HP	Voltage: V
	Full Load Amps: A	Service Factor:	Other:

Visual Inspection / Cleaning		
	Starter Identification Tag Installed: ☐ Yes ☐ No	Visual Signs of Overheating: ☐ Yes ☐ No
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Support Insulators: ☐ Good ☐ Acceptable ☐ Poor
	Connections ☐ Good ☐ Acceptable ☐ Poor	Electro/Mechanical Interlock: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	Contactor Condition: ☐ Good ☐ Acceptable ☐ Poor
	Door Mechanical ☐ Good ☐ Acceptable ☐ Poor	Contact Alignment: ☐ Good ☐ Acceptable ☐ Poor
	Verify O/L element is correctly sized for the load: ☐ Yes ☐ No	Exercise Circuit Breaker/MCP/Disconnect ☐ Yes
	Cables Supported Appropriately: ☐ Yes ☐ No	Unit Cleaned: ☐ Yes Photograph Taken: ☐ Yes
	Comments:	

Contact/Pole Measurements	**Test**	**A**	**B**	**C**	**Test Summary**
	Contact Resistance (μΩ)				☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Disconnect / Breaker / MCP Resistance (μΩ)				
	Fuse Resistance (μΩ)				
	Comments:				

Insulation Resistance Test

Test Preparation: Source: ☐ Isolated Contactor: ☐ Open Cable Dest. / Load: ☐ Disconnected ☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

Test	Voltage	Insulation Resistance (MΩ)			Ground all phases not under test!
		A	B	C	
Contactor Line To GND	1000 VDC				**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Contactor Load To GND	1000 VDC				
Contactor Line to Load	1000 VDC				

Comments:

Final Analysis

Returned to Service:	☐ Yes	☐ No	Comments:
Monitoring / Further Inspection Required:	☐ Yes	☐ No	
Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **AC MOTOR, LOW VOLTAGE**	Page: 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Motor Data				
	Size: kW / HP	Voltage: V		R.P.M:
	Manufacturer:	Model:		Serial Number:
	Frame Type:	FLA: A	Service Factor:	Other:
	Cooling: ☐ Air ☐ Fan	# Cooling Fans:	Winding Material:	

Visual Inspection / Cleaning				
	Motor Identification Tag Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Connections: ☐ Good ☐ Acceptable ☐ Poor		Air Baffles: ☐ Good ☐ Acceptable ☐ Poor	
	Paint: ☐ Good ☐ Acceptable ☐ Poor		Filter Media: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	
	Cooling Fans: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor		Fan Controls: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	
	Anchorage/Alignment: ☐ Good ☐ Acceptable ☐ Poor			
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor			
	Mechanical/Electrical Noise During Operation: ☐ Yes ☐ No		Lubrication Required: ☐ Yes ☐ No	
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor		Unit Cleaned: ☐ Yes	Photograph Taken: ☐ Yes

Winding Insulation Resistance	**Stator Winding**	**Test Voltage (Vdc)**	**Winding Temperature (°C)**	**Resistance (MΩ)**			**Dielectric Absorption Ratio**	**Polarization Index (a)**
				30 Sec	**1 min.**	**10 min. (a)**		
		500					-	-
			40					
		500					-	-
			40					
		500					-	-
			40					
	Notes: (a) Testing to 10 minutes and calculation of Polarization Index is only required for motors > 150 kW (200 HP)							
	Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed							

Winding Resistance	**Resistance (μΩ)**			**Test Summary**
	A - B	**B – C**	**A - C**	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Comments:			

Bearing Insulation Resistance

☐ Not Applicable

Bearing	Test Voltage (Vdc)	Bearing Temperature (°C)	Resistance (MΩ)	
			1 min.	Corrected to 40°C
	500			
	500			

Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed

RTD Resistance

☐ Not Applicable

Actual Winding Temperature: °C

Actual Bearing Temperature °C

RTD	Resistance (Ω)	Calculated Temperature (°C)	RTD	Resistance (Ω)	Calculated Temperature (°C)

Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed

Note: Test connection resistance of bolted connections. Report on cable inspection sheet.

Final Analysis

Returned to Service:	☐ Yes	☐ No	Comments:
Monitoring / Further Inspection Required:	☐ Yes	☐ No	
Repair / Replacement Required:	☐ Yes	☐ No	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **NON-FUSIBLE DISCONNECT SWITCH, 600V**	Page 1 of 2 ID:

Project	Facility:	Project Name:
	Area :	Bid Opportunity:

Disconnect Data	Manufacturer:	Model:	
	Rated Voltage: V	Current Rating: A	Interrupting Rating: A

Visual Inspection / Cleaning	Identification Tag Installed: ☐ Yes ☐ No	Visual Signs of Overheating: ☐ Yes ☐ No
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Support Insulators: ☐ Good ☐ Acceptable ☐ Poor
	Connections: ☐ Good ☐ Acceptable ☐ Poor	Blade Condition: ☐ Good ☐ Acceptable ☐ Poor
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	Verify Blade Mechanical Operation: ☐ Good ☐ Acceptable ☐ Poor
	Door Mechanical: ☐ Good ☐ Acceptable ☐ Poor	Unit Cleaned: ☐ Yes
	Fit Plumb & Square: ☐ Yes ☐ No	Unit Lubricated: ☐ Yes
	Cables Supported Appropriately: ☐ Yes ☐ No	Other:

Switchblade Resistance	**Resistance (μΩ) (As Left)**			**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	A	**B**	**C**	
	Comments:			

Insulation Resistance Test	Test Preparation: Source: ☐ Isolated Disconnect: ☐ Open	Cable Dest. / Load: ☐ Disconnected ☐ Connected with Load Isolated	Note: Approval of City's Representative is required, prior to leaving cables connected during the test.		
	Test	**Voltage**	**Insulation Resistance (MΩ)**		Ground all phases not under test!
			A	**B**	**C**
	Disconnect Line To GND	1000 VDC				**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Disconnect Load To GND	1000 VDC				
	Disconnect Line to Load	1000 VDC				
	Comments:					

Final Analysis	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **OUTDOOR LIGHTING**	Page 1 of 2
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact		
	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

Outdoor Lighting Location & Data						
	Battery Bank Location:	Battery Bank Equipment No.	Panel Feed: Circuit No.	Control Panel No.	Applicable Drawings:	
	Outdoor Lighting Fixtures:	Manufacturer:	Catalog No.		Control Type	
		Rated Voltage: VAC	Input Current: A	Lamp Wattage: W	Outdoor Fixtures Qty:	
		Installed on Outdoor Walls: ☐ North ☐ East ☐ South ☐ West				
	Photocell:	Manufacturer:	Catalog No.	Adjustable Turn-On Level: ☐ Yes ☐ No Adjustable Turn-Off Level: ☐ Yes ☐ No		
		Rated Voltage: VAC	Rated Current: A	Installed Location:	Turn-On / Turn-Off Ratio: ☐ N/A	

Visual Inspection / Cleaning				
	Identification Lamacoids Installed: ☐ Yes ☐ No		Lamps Properly Aimed: ☐ Yes ☐ No	
	Visual Signs of Moisture: ☐ Yes ☐ No		All Lamps Properly Operate: ☐ Yes ☐ No	
	Outdoor Lights Moisture Proof Rated: ☐ Yes ☐ No ☐ N/A		Outdoor Light Levels Adjustable: ☐ Yes ☐ No ☐ N/A	
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor		Cable Connections: ☐ Good ☐ Acceptable ☐ Poor	
	Ground Connections: ☐ Good ☐ Acceptable ☐ Poor		Connections Properly Sealed: ☐ Good ☐ Acceptable ☐ Poor	
	Photocell Installation: ☐ Good ☐ Acceptable ☐ Poor		Dimming Controller Installation: ☐ Good ☐ Acceptable ☐ Poor	
	Cables Supported Appropriately: ☐ Yes ☐ No		Equipment Cleaned: ☐ Yes	Photograph Taken: ☐ Yes
	Comments:			

Photocell & Controller Testing				
	Battery Bank Temperature Before Starting Testing: °C	Battery Bank Temperature After Testing Completed: °C	**Test Summary** ☐ Test Passed ☐ Test Inconclusive ☐ Further Investigation Required ☐ Test Failed	
	Photocell Turn-On Level: foot-candles	Photocell Turn-On Time: sec		
	Photocell Turn-Off Level: foot-candles	Photocell Turn-Off Time: sec		
	Measured Light Output: foot-candles	Dimming Controller Output: V		
	Comments:			

Operational Testing				
	Outdoor Lights Turn On and Off by Photocell in Automatic Mode: ☐ Yes ☐ No		Outdoor Lights Turn On in Manual Mode: ☐ Yes ☐ No	
	Light Output Adjustable by Dimming Controller: ☐ Yes ☐ No		Photocell Turn-On Level:	foot-candles
	Operating Modes	*Mode Description*	*Outdoor Lights On*	*Time For Outdoor Lights to Turn On*
		Automatic Mode – Normal Operation	No	N/A
		Automatic Mode – Photocell Operation	☐ Yes ☐ No	sec
		Manual Mode – Individual Normal Lighting Circuits Fail	☐ Yes ☐ No	sec
	Comments:			

Winnipeg	**COMMISSIONING FORM** **OUTDOOR LIGHTING**	Page 2 of 2
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **PLC ANALOG INPUT CARD**	Page 1 of 2 Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

PLC Data	PLC Enclosure Name:		PLC Manufacturer:	PLC Model:
	Card Catalog No.		Rated Input Voltage: VDC	Inputs 0-7 Fuse No.
	Documents:	I/O Wiring Dwg:	DNP3 I/O File:	Control Narrative:
	PLC:	Equipment Tag:	Rack:	Module:

Visual Inspection	Pre-Manufactured Cable Labelled:	☐ Yes	☐ No	Pre-Manufactured Cable Tag:			
	All Inputs Wired to Terminal Blocks:	☐ Yes	☐ No	All Input Wires Labelled at Terminal Blocks:	☐ Yes	☐ No	
	All Inputs Separately Fused:	☐ Yes	☐ No	All Inputs Wired at Analog Input Card:	☐ Yes	☐ No	
	Cleanliness:	☐ Good	☐ Acceptable ☐ Poor	Wire Connections Both Ends:	☐ Good	☐ Acceptable	☐ Poor
	Fully Functioning Card:	☐ Good	☐ Acceptable ☐ Poor	Card Secured on PLC Rack:	☐ Good	☐ Acceptable	☐ Poor
	Card Fully Programmed:	☐ Good	☐ Acceptable ☐ Poor	All Card Input Lights Work:	☐ Good	☐ Acceptable	☐ Poor
	Comments:						

Point	Physical Tag	Description	Signal Type	Signal Mapping	PLC Input	Local HMI	SCADA	Condition Pickup Level	Pass (P/F)
0			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	
1			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	
2			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	
3			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	
4			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	
5			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	
6			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	
7			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low: mA/V = High: mA/V =	☐	☐	☐	☐ Low ☐ High ☐ N/A	

Winnipeg	**COMMISSIONING FORM** **PLC ANALOG INPUT CARD**	Page 2 of 2
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **PLC ANALOG OUTPUT CARD**	Page 1 of 2 Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

PLC Data	PLC Enclosure Name:		PLC Manufacturer:	PLC Model:
	Card Catalog No.		Rated Output Voltage: VAC / VDC	Outputs 0-3 Fuse No.
	Documents:	I/O Wiring Dwg:	DNP3 I/O File:	Control Narrative:
	PLC:	Equipment Tag:	Rack:	Module:

Visual Inspection	Pre-Manufactured Cable Labelled: ☐ Yes ☐ No	Pre-Manufactured Cable Tag:
	All Outputs Wired to Terminal Blocks: ☐ Yes ☐ No	All Output Wires Labelled at Terminal Blocks: ☐ Yes ☐ No
	All Outputs Separately Fused: ☐ Yes ☐ No	All Outputs Wired at Analog Output Card: ☐ Yes ☐ No
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor	Wire Connections Both Ends: ☐ Good ☐ Acceptable ☐ Poor
	Fully Functioning Card: ☐ Good ☐ Acceptable ☐ Poor	Card Secured on PLC Rack: ☐ Good ☐ Acceptable ☐ Poor
	Card Fully Programmed: ☐ Good ☐ Acceptable ☐ Poor	All Card Input Lights Work: ☐ Good ☐ Acceptable ☐ Poor
	Comments:	

Point	Physical Tag	Description	Signal Type	State Mapping	PLC Input	SCADA	Field Device	Pass (P/F)
0			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low mA/V = High mA/V =	☐	☐	☐	
1			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low mA/V = High mA/V =	☐	☐	☐	
2			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low mA/V = High mA/V =	☐	☐	☐	
3			☐ 0 – 20mA ☐ 4 – 20mA ☐ 0 – 10V	Low mA/V = High mA/V =	☐	☐	☐	

Final Analysis	Returned to Service: ☐ Yes ☐ No	Comments:	
	Monitoring / Further Inspection Required: ☐ Yes ☐ No		
	Repair / Replacement Required: ☐ Yes ☐ No		

Comments:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

	Company	Name	Signature	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **PLC DISCRETE INPUT CARD**	Page 1 of 3 Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

PLC Data	PLC Enclosure Name:		PLC Manufacturer:	PLC Model:
	Card Catalog No.		Rated Inputs Voltage: VAC / VDC	Inputs 0-15 Fuse No. Inputs 16-31 Fuse No.
	Documents:	I/O Wiring Dwg:	DNP3 I/O File:	Control Narrative:
	PLC:	Equipment Tag:	Rack:	Module:

Visual Inspection	Pre-Manufactured Cable Labelled: ☐ Yes ☐ No		Pre-Manufactured Cable Tag:	
	All Inputs Wired to Terminal Blocks: ☐ Yes ☐ No		All Input Wires Labelled at Terminal Blocks: ☐ Yes ☐ No	
	All Inputs Separately Fused: ☐ Yes ☐ No		All Inputs Wired at Discrete Input Card: ☐ Yes ☐ No	
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor		Wire Connections Both Ends: ☐ Good ☐ Acceptable ☐ Poor	
	Fully Functioning Card: ☐ Good ☐ Acceptable ☐ Poor		Card Secured on PLC Rack: ☐ Good ☐ Acceptable ☐ Poor	
	Card Fully Programmed: ☐ Good ☐ Acceptable ☐ Poor		All Card Input Lights Work: ☐ Good ☐ Acceptable ☐ Poor	
	Comments:			

Point	Physical Tag	Description	State	State Description	PLC Input	Local HMI	SCADA	Alarm	Pass (P/F)
0			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
1			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
2			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
3			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
4			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
5			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
6			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
7			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
8			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	

Winnipeg	**COMMISSIONING FORM** **PLC DISCRETE INPUT CARD**	Page 2 of 3
		Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Point	Physical Tag	Description	State	State Description	PLC Input	Local HMI	SCADA	Alarm	Pass (P/F)
9			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
10			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
11			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
12			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
13			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
14			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
15			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	

Point	Physical Tag	Description	State	State Description	PLC Input	Local HMI	SCADA	Alarm	Pass (P/F)
16			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
17			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
18			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
19			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
20			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
21			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
22			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
23			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
24			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	

Winnipeg	**COMMISSIONING FORM** **PLC DISCRETE INPUT CARD**	Page 3 of 3
		Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Point	Physical Tag	Description	State	State Description	PLC Input	Local HMI	SCADA	Alarm	Pass (P/F)
25			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
26			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
27			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
28			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
29			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
30			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	
31			0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off	

Final Analysis			Comments:
	Returned to Service:	☐ Yes ☐ No	
	Monitoring / Further Inspection Required:	☐ Yes ☐ No	
	Repair / Replacement Required:	☐ Yes ☐ No	

Comments:

	Company	Name	Signature	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **PLC DISCRETE OUTPUT CARD**	Page 1 of 2 Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

PLC Data	PLC Enclosure Name:		PLC Manufacturer:	PLC Model:
	Card Catalog No.		Rated Output Voltage: VAC / VDC	Outputs 0-7 Fuse No.
	Documents:	I/O Wiring Dwg:	DNP3 I/O File:	Control Narrative:
	PLC:	Equipment Tag:	Rack:	Module:

Visual Inspection	Pre-Manufactured Cable Labelled: ☐ Yes ☐ No		Pre-Manufactured Cable Tag:	
	All Outputs Wired to Terminal Blocks: ☐ Yes ☐ No		All Output Wires Labelled at Terminal Blocks: ☐ Yes ☐ No	
	All Outputs Separately Fused: ☐ Yes ☐ No		All Outputs Wired at Discrete Output Card: ☐ Yes ☐ No	
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor		Wire Connections Both Ends: ☐ Good ☐ Acceptable ☐ Poor	
	Fully Functioning Card: ☐ Good ☐ Acceptable ☐ Poor		Card Secured on PLC Rack: ☐ Good ☐ Acceptable ☐ Poor	
	Card Fully Programmed: ☐ Good ☐ Acceptable ☐ Poor		All Card Input Lights Work: ☐ Good ☐ Acceptable ☐ Poor	
	Comments:			

Point	Physical Tag	Description	State	State Description	PLC Output	SCADA	Field Device	Pass (P/F)
0			0		☐	☐	☐	
			1		☐	☐	☐	
1			0		☐	☐	☐	
			1		☐	☐	☐	
2			0		☐	☐	☐	
			1		☐	☐	☐	
3			0		☐	☐	☐	
			1		☐	☐	☐	
4			0		☐	☐	☐	
			1		☐	☐	☐	
5			0		☐	☐	☐	
			1		☐	☐	☐	
6			0		☐	☐	☐	
			1		☐	☐	☐	
7			0		☐	☐	☐	
			1		☐	☐	☐	

Winnipeg	**COMMISSIONING FORM** **PLC DISCRETE OUTPUT CARD**	Page 2 of 2
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **PANELBOARD, LOW VOLTAGE**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Panelboard Data				
	Location:	Fed From:		No. of Circuits:
	Manufacturer:	Model:	Serial No:	
	Rated Voltage: V	Current Rating: A	Withstand Rating: A	
	☐ Single Phase ☐ 3 Phase, 3 Wire ☐ 3 Phase, 4 Wire	Neutral Bonded to Ground ☐ Yes ☐ No		
	☐ Main Lugs			
	☐ Main Breaker: Rating: A Manufacturer: Model: Inst. Setting:			
	Complete separate inspection form (F-BKR-MC-LV) for main breaker if >= 250A, or has long, short, or ground fault settings.			

Visual Inspection / Cleaning				
	Identification Tag Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Visual signs of Moisture: ☐ Yes ☐ No		Visual Signs of Corona: ☐ Yes ☐ No	
	Fuse/Breaker Sizes Match Drawings: ☐ Yes ☐ No		Cables Supported Appropriately: ☐ Yes ☐ No	
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor		Connections: ☐ Good ☐ Acceptable ☐ Poor	
	Door Mechanical: ☐ Good ☐ Acceptable ☐ Poor		Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	
	Exercise All Circuit Breakers: ☐ Yes ☐ No		Comments:	

Insulation Resistance Test

Test Preparation: Source: ☐ Disconnected ☐ Connected with Source Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

Equipment Temperature: °C

Temperature Correction Factor to 20°C:

Test Voltage	**Insulation Resistance (MΩ) Ground all Phases not under test!**							
	A-GND		**B-GND**		**C-GND**		**N-GND**	
	RDG	20°C	RDG	20°C	RDG	20°C	RDG	20°C

Test Summary

☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Test Voltages: 120-300V → 500 VDC Test Voltage 301-600V → 1000 VDC Test Voltage

Comments:

Load/Feeder Breakers

Breakers < 100A and Without Inst. Setting

List by model of breaker. Multiple breakers of varying ampacity may be listed per line.

Type	**Manufacturer**	**Model Series**	**Interrupting Rating (kA)**	**Positions/Circuits**	**Notes**
A					
B					
C					
D					
E					
F					

Load/Feeder Breakers	Breakers >= 100A or with Inst. Setting								
	List each breaker individually. Complete separate inspection form (F-BKR-MC-LV) for breaker if >= 250A, or has long, short, or ground fault settings.								
	ID	**Pos.**	**Manufacturer**	**Model**	**Trip Rating (A)**	**Int. Rating (kA)**	**Inst. Setting**	**Separate Form**	**Notes**
								☐	
								☐	
								☐	
								☐	
								☐	
								☐	

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**COMMISSIONING FORM** **VARIABLE FREQUENCY DRIVE**	Page 1 of 4
		Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Project Contact		
	General Contractor:	Project Manager:
	Consultant:	Contract Administrator:
	City of Winnipeg	Consulting Project Manager:

VFD Location & Data						
	VFD Downstream Load:		VFD Location:		Section No. ☐ N/A	
	Drawings:	Single Line:	Schematic:		Connection:	
	VFD:	Manufacturer:	Model:		Serial #:	
		Power Rating:	Rated Voltage: VAC	Current Rating: A	Control Voltage: VAC	
	Circuit Protection:	☐ Breaker ☐ Fuse	Rating: A	Inst. Setting: A	Manufacturer: Model:	
	Line Reactor:	☐ Installed ☐ N/A	Rating:		Manufacturer: Model:	
	Harmonic Filter:	☐ Installed ☐ N/A	Rating:		Manufacturer: Model:	
	Load Reactor:	☐ Installed ☐ N/A	Rating:		Manufacturer: Model:	
	Bypass Contactor:	Type: ☐ NEMA ☐ IEC ☐ N/A	Manufacturer:		Model:	
			NEMA Size: ☐ N/A		IEC Rating: A ☐ AC-3 ☐ AC-4	
	Bypass Overload Protection:	☐ Thermal ☐ Electronic ☐ Not Applicable	Class: ☐ 10 ☐ 20 ☐ 30 ☐ Unknown	Setting / Rating: A	Manufacturer: Model:	
	Current Transformer:		Ratio:		Type:	
	Control Power Transformer:		Size: VA	Secondary Voltage: V	Primary Fuse: A	Secondary Fuse: A

Motor Data				
	Equipment Tag:	Power: kW / HP		Voltage: VAC
	Full Load Amps: A	Service Factor:	Inverter Duty Rated: ☐ Yes ☐ No	Insulation Class:

Visual Inspection / Cleaning				
	VFD Lamacoid Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Power Cables Labelled at Both Ends: ☐ Yes ☐ No		Control Cables Labelled at Both Ends: ☐ Yes ☐ No	
	Cleanliness: ☐ Good ☐ Acceptable ☐ Poor		Power Cable Connections: ☐ Good ☐ Acceptable ☐ Poor	
	Control Cable Connections: ☐ Good ☐ Acceptable ☐ Poor		Elect./ Mech. Interlocks: ☐ Good ☐ Acceptable ☐ Poor	
	Ground Connections: ☐ Good ☐ Acceptable ☐ Poor		Contactor Condition: ☐ Good ☐ Acceptable ☐ Poor	
	Door Mechanical: ☐ Good ☐ Acceptable ☐ Poor		Contact Alignment: ☐ Good ☐ Acceptable ☐ Poor	
	Verify Bypass O/L element is correctly sized for the load: ☐ Yes ☐ No ☐ N/A		Exercised Circuit Breaker / Disconnect: ☐ Yes ☐ No	
	Cables Supported Appropriately: ☐ Yes ☐ No		Equipment Cleaned: ☐ Yes	Photograph Taken: ☐ Yes
	Comments:			

Winnipeg	**COMMISSIONING FORM VARIABLE FREQUENCY DRIVE**	Page 2 of 4 Equipment Tag:

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

Contact / Pole Measurements

Test	Resistance (μΩ)			Test Summary
	Phase A	Phase B	Phase C	☐ Test Passed
Harmonic Filter Contactor Contact				☐ Test Inconclusive Further Investigation Required.
Bypass Contactor Contact				
Breaker / Disconnect				☐ Test Failed

Comments:

Insulation Resistance Test

Test Preparation:
Setup:
Source: ☐ Isolated
Contactor: ☐ Open

Cable Destination / Load:
☐ Disconnected
☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

WARNING: DISCONNECT ALL POWER CABLES FROM VFD MODULE AND CAPACITORS, AND DISCONNECT ALL CONTROL POWER FUSES PRIOR TO TEST.

Test	Voltage	Insulation Resistance (MΩ)			Ground all phases not under test!
		Phase A	Phase B	Phase C	
VFD Line to Ground	1000 VDC				
VFD Load to Ground	1000 VDC				
VFD Line to Load	1000 VDC				**Test Summary**
Harmonic Filter Contactor Line to Ground	1000 VDC				☐ Test Passed
Harmonic Filter Contactor Load to Ground	1000 VDC				☐ Test Inconclusive Further Investigation Required.
Harmonic Filter Contactor Line to Load	1000 VDC				
Bypass Contactor Line to Ground	1000 VDC				☐ Test Failed
Bypass Contactor Load to Ground	1000 VDC				
Bypass Contactor Line to Load	1000 VDC				

Comments:

Full Load Operational Testing

Ramp Up Time	Specified:		sec	Actual:		sec
Ramp Down Time	Specified:		sec	Actual:		sec
Motor Measured Current	Phase A	A	Phase B A	Phase C	A	
VFD Displayed Current	Phase A	A	Phase B A	Phase C	A	
PLC HMI Screen Displayed Motor Current:	A		Ammeter Current in Bypass Mode: ☐ Yes ☐ No ☐ N/A			
Potentiometer Adjusts Speed in Manual Mode: ☐ Yes ☐ No			Potentiometer Adjusts Speed in Local Auto Mode: ☐ Yes ☐ No			

Operating Modes	*Mode Description*	*Forward Run Start & Stop*	*Reverse Run Start & Stop*
	VFD Manual Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
	VFD Automatic Mode – PLC Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
	VFD Automatic Mode – Local Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
	Bypass Manual Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
	Bypass Automatic Mode – Local Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

Comments:

Winnipeg	**COMMISSIONING FORM VARIABLE FREQUENCY DRIVE**	Page 3 of 4
		Equipment Tag:

Project	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

VFD Settings	Program VFD Settings to Match Setting Letter.	Comments:
	Settings Applied to VFD: ☐ Yes ☐ No	
	VFD Setting Letter File:	

VFD & PLC Control Signals

Verify Control Signals Between VFD and PLC	Comments:
Test Preparation: Test physical signals rather than installing jumpers for signals	
Field Wires Labelled at Both Ends: ☐ Yes ☐ No	

Discrete Signals

Signal Description	*Pilot Light Illuminates*	*Signal Received at PLC Card*	*Signal Appears on HMI Screen*	*SCADA Can See Signal*
Ready	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
VFD Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Bypass Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Manual Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Auto Mode	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Forward Run	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Reverse Run	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
VFD Fault	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Bypass Fault	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Vibration Lockout	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

Analog Signals

Signal Description	*Measured Signal*	*Signal received At VFD / PLC Card*	*Signal Appears on HMI Screen*	*SCADA Can See Signal*
Speed Input	mA	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Speed Reference	mA	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Motor Current	mA	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

Final Analysis	Returned to Service: ☐ Yes ☐ No	Comments:
	Monitoring / Further Inspection Required: ☐ Yes ☐ No	
	Repair / Replacement Required: ☐ Yes ☐ No	

Project			
	Facility:	Project Name:	
	Area:	RPF No.	Tender No.

	Company	Name	Signature	**Date** (yyyy/mm/dd)
General Contractor Representative				
City Representative				

Note: The General Contractor Representative is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.