APPENDIX D

Test Forms

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	**INSPECTION FORM** **POWER CABLE < 1000V**	Page 1 of 1 Cable ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Cable Data				
	Source:		Dest. / Load:	
	Manufacturer:	Type:	Conductor: ☐ Copper ☐ Aluminum	
	No. of Conductors:	Size: ☐ AWG ☐ MCM	Length: m ☐ Measured ☐ Jacket Markings ☐ Previous Data ☐ TDR	
	Rated Voltage: V	Operating Voltage: V	Date Installed:	
	Installation: ☐ Cable Tray ☐ Strapped ☐ EMT ☐ Steel Conduit ☐ Alum. Conduit ☐ PVC Conduit ☐ Direct Buried ☐ Underground Duct Other:			

Visual Inspection				
	Physical Damage on Exposed Ends:	☐ Yes ☐ No	Cable Identification Tag Installed:	☐ Yes ☐ No
	Visual Signs of Overheating:	☐ Yes ☐ No	Cable Supported Appropriately:	☐ Yes ☐ No
	Bend Radius Acceptable:	☐ Yes ☐ No	Comments:	

Insulation Resistance Test

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.

Cable Temperature: °C Temperature Correction Factor for 20°C:
Ground all conductors not under test for each reading.

Test Voltage		**Insulation Resistance (MΩ)**				**Test Summary**
		A-GND	**B-GND**	**C-GND**	**N-GND**	
V	Reading					☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Corrected to 20°C					

Utilize 1000VDC Test Voltage for 600V rated cables, 500VDC for cables rated <= 300V.

Comments:

Connection Resistance

Note: Torque check required for all cables. Connection Resistance Test required for cables 4/0 AWG or larger.

Termination	**Connection Resistance (μΩ) - As Left**				**Torque Check**
	A	**B**	**C**	**N**	
Source					☐ OK
Dest. / Load					☐ OK

Comments:

Final Analysis			
	Cable 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				

Winnipeg	**INSPECTION FORM** **CONTROL POWER TRANSFORMER, 600V**	Page 1 of 1 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

PT Data			
	Location:	Pri. Voltage Rating:	Sec. Voltage Rating:
	Manufacturer:	Pri. Fuse Size:	Sec. Fuse Size:
	Size:	Type:	Other:

Visual Inspection				
	Physical Damage:	☐ Yes ☐ No	Defective Connections/Wiring:	☐ Yes ☐ No
	Visual Signs of Overheating:	☐ Yes ☐ No	Grounding and Shorting Connections Provide Contact:	☐ Yes ☐ No
	Verify Ground Connection:	☐ Yes ☐ No	Verify Withdrawal Mechanism Function:	☐ Yes ☐ No
	Fuse Sizes Match Drawings:	☐ 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.

Test	**Voltage**	**Insulation Resistance (MΩ)**	Temperature: °C
Primary To GND	1000 VDC		**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Secondary To GND	500 VDC		
Primary To Secondary	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** **CURRENT TRANSFORMER**	Page 1 of 1 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

CT Data			
	Location:	Current Ratio: : A	Voltage Class: V
	Manufacturer:	Model No.:	Type: ☐ Bar ☐ Window (Solid) ☐ Split Core
	Burden Rating:	BIL: kV	Accuracy Class:

Visual Inspection				
	Physical Damage:	☐ Yes ☐ No	Clean and Inspect Insulators:	☐ Yes ☐ No
	Visual Signs of Overheating:	☐ Yes ☐ No	Verify Connections are Correct:	☐ Yes ☐ No
	Adequate Mounting Support:	☐ Yes ☐ No	Comments:	

Insulation Resistance Test

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.

Test	**Voltage**	**Insulation Resistance (MΩ)**			Temperature: °C
		A	**B**	**C**	**Test Summary**
Primary To GND	1000 V				☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Secondary To GND	500 V				
Primary To Secondary	1000 V				

Comments:

Turns Ratio, Excitation, Saturation and Polarity Tests

Note: Attach supporting data and saturation curve.

	Phase				**Test Summary**
	A	**B**	**C**	**N**	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Calculated Ratio					
Measured Ratio					
Exciting Current (mA)					
Polarity Correct	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
CT Saturation Test Performed:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

Final Analysis			
	CT 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** **DIGITAL METER**	Page 1 of 2 ID:

Project	Facility:	Project Name:
	Area :	Bid Opportunity:

Meter Data	Location:	Cell #:
	Manufacturer:	Model:

Visual Inspection / Cleaning	Cover Gasket:	☐ Good ☐ Acceptable ☐ Poor	Cover Glass:	☐ Good ☐ Acceptable ☐ Poor
	General Condition:	☐ Good ☐ Acceptable ☐ Poor		
	Cleanliness (as found)	☐ Good ☐ Acceptable ☐ Poor	Unit Cleaned:	☐ Yes
	Connections (as found)	☐ Good ☐ Acceptable ☐ Poor	Connections Torqued:	☐ Yes

Test Meter	Manufacturer:	Model:
	Calibration Date:	Meter calibration must be within one year, unless otherwise specified.

		Nominal Test Value (V)	**Phase**	**Calibrated Meter Measurement (V)**	**Meter Under Test (V)**	**Difference (V)**	**Error (%)**	**Acceptable** (See Specs)
Accuracy	**Voltage**	0						☐ Yes ☐ No
								☐ Yes ☐ No
								☐ Yes ☐ No
								☐ Yes ☐ No
								☐ Yes ☐ No
								☐ Yes ☐ No
		Nominal Test Value (V)	**Phase**	**Calibrated Meter Measurement (A)**	**Meter Under Test (A)**	**Difference (A)**	**Error (%)**	**Acceptable** (See Specs)
	Current	0	A					☐ Yes ☐ No
			B					☐ Yes ☐ No
			C					☐ Yes ☐ No
			A					☐ Yes ☐ No
			B					☐ Yes ☐ No
			C					☐ Yes ☐ No
	Measurements Applicable To:	☐ As-Found ☐ As-Left		May check both boxes if applicable.				
	Unit Calibration Adjusted:	☐ Yes ☐ No		If calibration was adjusted, complete two forms, one for as-found, the other for as-left after calibration.				

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 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** **EMERGENCY LIGHTING**	Page 1 of 1 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Battery Unit Data				
Location:		Fed From:		Circuit #:
Manufacturer:		Model:		Serial No:
Input Voltage: V AC	Input Current: A	Output Voltage: V DC		Wattage: W
Qty of Internal Lamps:	Internal Lamp Wattage: W	Type of Internal Lamps:		

Remote Fixtures			
Quantity:	Manufacturer:	Model:	
Input Voltage: V DC	Input Current: A	Qty of Lamps per Fixture:	
Lamp Wattage: W	Type of Lamps:	Wire Size: AWG	

Visual Inspection / Cleaning		
Identification Tag Installed: ☐ Yes ☐ No	Lamps Properly Aimed: ☐ Yes ☐ No	
Visual signs of Moisture: ☐ Yes ☐ No	Connections: ☐ Good ☐ Acceptable ☐ Poor	
Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	
Comments:		

Battery Testing		
Equipment Temperature: ℃	**Test Summary**	
Test Results Stated Design Time (From Drawings): Min Time Until Lamps Turn Off: Min	☐ Test Passed ☐ Test Inconclusive ☐ Further Investigation Required. ☐ Test Failed	
Comments:		

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	**INSPECTION FORM** **FUSED 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

Fuse Data			
	Manufacturer:	Type:	Cat. #:
	Rated Voltage: V	Current Rating: A	Holder:

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	Fuse Holder Support and Contact Integrity: ☐ Good ☐ Acceptable ☐ Poor	
	Fit Plumb & Square: ☐ Yes ☐ No	Unit Cleaned: ☐ Yes	Unit Lubricated: ☐ Yes
	Cables Supported Appropriately: ☐ Yes ☐ No	Other:	

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

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

Winnipeg	**INSPECTION FORM** **FUSED DISCONNECT SWITCH, 600V**	Page 2 of 2 ID

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	INSPECTION FORM GROUNDING/BONDING CONNECTION RESISTANCE	Page 1 of 2 Area:

Project	Facility:	Project Name:
	Area :	Bid Opportunity:

Resistance Checks (Ductor Test)	Point A	Point B	Resistance (mΩ)	Acceptable
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
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				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
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				☐ Yes ☐ No ☐ Inconclusive
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				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
	Comments:			

Winnipeg	**INSPECTION FORM** **GROUNDING/BONDING CONNECTION RESISTANCE**	Page 2 of 2 ID:

Resistance Checks (Ductor Test)	**Point A**	**Point B**	**Resistance (mΩ)**	**Acceptable**
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
				☐ Yes ☐ No ☐ Inconclusive
	Comments:			

Final Analysis			
	Monitoring / Inspection Required: ☐ Yes ☐ No		Comments:
	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** **INTELLIGENT OVERLOAD**	Page 1 of 2 ID:

Project	Facility:	Project Name:
	Area :	Bid Opportunity:

O/L Data	Location:	Cell #:
	Manufacturer:	Model:

Visual Inspection / Cleaning	General Condition: ☐ Good ☐ Acceptable ☐ Poor	
	Cleanliness (as found) ☐ Good ☐ Acceptable ☐ Poor	Unit Cleaned: ☐ Yes
	Connections (as found) ☐ Good ☐ Acceptable ☐ Poor	Connections Torqued: ☐ Yes

Communication Settings	Static IP Address:	Subnet Mask
	Gateway:	Protocol:
	MAC Address:	

Test Meter	Manufacturer:	Model:
	Calibration Date:	Meter calibration must be within one year, unless otherwise specified.

CTs	Type: ☐ Internal to O/L ☐ External	External CT Ratio:
	External Ground CT: ☐ Yes ☐ No	Ground CT Ratio:

Accuracy

Verify accuracy of Intelligent O/L Measurements with the use of software via the communication network.

Current

Nominal Test Value (A)	Phase	Calibrated Meter Measurement (A)	Intelligent O/L Measurement (A)	Difference (A)	Error (%)	Acceptable (See Specs)
0	A					☐ Yes ☐ No
	B					☐ Yes ☐ No
	C					☐ Yes ☐ No
	A					☐ Yes ☐ No
	B					☐ Yes ☐ No
	C					☐ Yes ☐ No

Measurements Applicable To: ☐ As-Found ☐ As-Left May check both boxes if applicable.

Unit Calibration Adjusted: ☐ Yes ☐ No If calibration was adjusted, complete two forms, one for as-found, the other for as-left after calibration.

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** **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

Feeder Breakers

ID	Loc./ Cell	Frame Rating (A)	Trip Rating (A)	Manuf.	Model	Trip Unit Type	Inst Setting	Visual Inspection	Cleaned	Comments
									☐	
									☐	
									☐	
									☐	
									☐	
									☐	
									☐	
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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	
		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** **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** **MOTOR SOFT STARTER, 600V**	Page 1 of 3 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Starter Data						
	Load:		Starter Location:			Cell #:
	Soft Starter:	Manufacturer:		Model:		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:
	Bypass Contactor:	Type: ☐ NEMA ☐ IEC ☐ N/A	Manufacturer:			Model:
			NEMA Size:	IEC Rating: A ☐ AC-3 ☐ AC-4		
	Bypass Overload Protection:	☐ Thermal ☐ Electronic ☐ Not Applicable	Class: ☐ 10 ☐ 20 ☐ 30 ☐ Unknown	Setting / Rating: A		Manufacturer: Model:
	Capacitor Contactor:	Type: ☐ NEMA ☐ IEC ☐ N/A	Manufacturer:			Model:
			NEMA Size:	IEC Rating: A ☐ AC-3 ☐ AC-4		
	Control Power Transformer:	Size: VA	Sec. Voltage: V	Primary Fuse: A		Secondary Fuse: A
	Current Transformer:	Ratio:		Type:		

Motor Data				
	ID:	Size: kW / HP		Voltage: V
	Full Load Amps: A	Service Factor: ☐ 1.00 ☐ 1.15	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: ☐ 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
Bypass Contactor Contact Resistance (μΩ)				☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Capacitor Contactor Contact Resistance (μΩ)				
Disconnect Resistance (μΩ)				
Main Fuse Resistance (μΩ)				
Capacitor 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.

WARNING: DISCONNECT ALL POWER CABLES FROM SOFT STARTER MODULE AND ALL CONTROL POWER FUSES PRIOR TO 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				
Bypass Contactor Line To GND	1000 VDC				
Bypass Contactor Load To GND	1000 VDC				
Bypass Contactor Line to Load	1000 VDC				
Capacitor Contactor Line To GND	1000 VDC				
Capacitor Contactor Load To GND	1000 VDC				
Capacitor Contactor Line to Load	1000 VDC				

Comments:

Operational Inspection	Test Preparation: Run motor at normal load.						
	Ramp Up Time	Specified:	sec	Actual:	sec	Comments:	
	Measured Motor Current	ØA	A	ØB	A	ØC	A
	Soft Start Motor Current	ØA	A	ØB	A	ØC	A
	Ammeter Displayed Motor Current:	A					
	Remote (RTU/PLC/DCS) Displayed Motor Current:	A					
	Ramp Down Time	Specified:	sec	Actual:	sec		

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:		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:			

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

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**
	A	**B**	**C**	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	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	**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	**INSPECTION FORM** **POTENTIAL TRANSFORMER, 600V**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

PT Data					
	PT Location or Designation:		Pri. Voltage Rating:		Sec. Voltage Rating:
	Manufacturer:	Catalogue #:	Pri. Fuse Size:		Sec. Fuse Size:
	Size: VA	Type:	Other:		

Visual Inspection				
	Physical Damage:	☐ Yes ☐ No	Verify Connections are Correct:	☐ Yes ☐ No
	Visual Signs of Overheating:	☐ Yes ☐ No	Grounding and Shorting Connections Provide Contact:	☐ Yes ☐ No
	Verify Ground Connection:	☐ Yes ☐ No	Verify Withdrawal Mechanism Function:	☐ Yes ☐ No
	Fuse Sizes Match Drawings:	☐ 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.

Test	**Voltage**	**Insulation Resistance (MΩ)**			Temperature: °C
		PT 1	**PT 2**	**PT 3**	**Test Summary**
Primary To GND	1000 V				☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Secondary To GND	500 V				
Primary To Secondary	1000 V				

Comments:

Turns Ratio and Polarity Tests

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

	Phase						**Test Summary**
	PT 1		**PT 2**		**PT 3**		☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Calculated Ratio							
Measured Ratio							
Polarity Correct	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	

Comments:

Final Analysis			
	PT 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** **SWITCHGEAR, 600V**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Switchgear Data			
	Location:	No. of Cells:	
	Manufacturer:	Type:	Serial #:
	Rated Voltage: V	Current Rating: A	Interrupting 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: ☐ 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	

Insulation Resistance Test

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.

Test Voltage	**Insulation Resistance (MΩ) Phase To GND**			Temperature: °C
	A	**B**	**C**	
1000 V				**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Test Voltage	**Insulation Resistance (MΩ) Phase To Phase**			
	A – B	**B – C**	**A - C**	
1000 V				

Comments:

Ground Resistance

Point A	Point B	Resistance (μΩ)	Test Summary
Switchgear GND Bus	Facility Ground Electrode		☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Switchgear GND Bus	Switchgear Enclosure		
Switchgear GND Bus	System Neutral		

Comments:

Connection Resistance

To	From	Resistance (μΩ)			Test Summary
		A	B	C	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed

Comments:

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(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 SWITCHBOARD, 600V**	Page 1 of 4 ID:

Project	Facility:	Project Name:
	Area :	Bid Opportunity:

SWB 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:	☐ 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: ℃

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)
SWB GND Bus	Facility Ground Electrode	
SWB GND Bus	SWB Enclosure	
SWB 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

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Feeder Breakers	ID	Loc./ Cell	Frame Rating (A)	Trip Rating (A)	Manuf.	Model	Trip Unit Type	Inst Setting	Visual Inspection	Cleaned	Comments
										☐	
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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** **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 ☐ Y	Secondary Winding: ☐ Δ ☐ Y		Impedance: %Z		Temp Rise: ℃		K Factor:			
	Winding Material: ☐ Copper ☐ Aluminum										
	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.