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**	**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	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** **POWER CABLE, 4160V**	Page 1 of 3 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 ☐ Previous Data ☐ Jacket Markings ☐ 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/Corona:	☐ Yes ☐ No	Cable Supported Appropriately:	☐ Yes ☐ No
	Damage to Splices/Terminations:	☐ Yes ☐ No	Shield Grounded:	☐ 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**	
2500V	Reading				☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Corrected to 20°C				

Comments:

High Potential Very Low Frequency (VLF) 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.

Frequency: 0.1 Hz **Waveform:** sinusoidal

Ground all conductors not under test for each reading.

Test Voltage (RMS)	Elapsed Time (min)	Peak Leakage Current (uA)			Test Summary
		A-GND	B-GND	C-GND	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
7000V	0				
7000V	1				
7000V	2				
7000V	3				
7000V	4				
7000V	5				
7000V	6				
7000V	7				
7000V	8				
7000V	9				
7000V	10				
7000V	11				
7000V	12				
7000V	13				
7000V	14				
7000V	15				

Comments:

Dissipation Factor (Tangent Delta) Test

Frequency: 0.1 Hz **Waveform:** sinusoidal

Test Voltage (RMS)	A			B			C		
	Tan Delta	Capacitance (nF)	Current (µA)	Tan Delta	Capacitance (nF)	Current (µA)	Tan Delta	Capacitance (nF)	Current (µA)
2400V									
4800V									
Difference									

Test Summary

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

Comments:

Connection Resistance

Termination	Connection Resistance (µΩ) - As Left			Torque Check
	A	B	C	
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				

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** **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** **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** **GROUNDING/BONDING CONNECTION RESISTANCE**	Page 1 of 1 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
	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 GROUNDING SYSTEM**	Page 1 of 3 ID:

Project	Facility:	Project Name:
	Area :	Bid Opportunity:

Visual Inspection	Connection to Ground Electrode is Visible:	☐ Yes ☐ No	Facility Contains a Main Ground Bus:	☐ Yes	☐ No
	Connecting Conductor: Size:	Qty:	Torque Ground Connections:	☐ Yes	☐ No
	Visual signs of Corrosion:	☐ Yes ☐ No			
	Soil Type:		Soil Condition: ☐ Dry ☐ Damp ☐ Wet		
	Comments:				

Fall Of Potential Test #1	Date of Test:		Time of Test:			
	Weather and Temperature:		Terrain:			
	Grounding System Connection Point:	UTM GPS Coordinate:	E	N		
	Current Probe Injection Point:	UTM GPS Coordinate:	E	N		
	Test Conditions:		Test Layout:			

Voltage Probe Distance (meters)	**UTM GPS Coordinate:**	**Test Current (mA)**	**Test Voltage (mV)**	**Resistance @ Hz (Ω)**	**Resistance @ Hz (Ω)**
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				
	E N				

Comments:

Fall Of Potential Test #2

Date of Test:				Time of Test:		
Weather and Temperature:				Terrain:		
Grounding System Connection Point:		UTM GPS Coordinate:	E	N		
Current Probe Injection Point:		UTM GPS Coordinate:	E	N		
Test Conditions:				Test Layout:		

Voltage Probe Distance (meters)	UTM GPS Coordinate:		Test Current (mA)	Test Voltage (mV)	Resistance @ Hz (Ω)	Resistance @ Hz (Ω)
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
	E	N				
Comments:						

Resistance Checks (Ductor Test)

Point A	Point B	Resistance (mΩ)	Test Summary
Facility Ground Electrode	Main Ground Bus		☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Facility Ground Electrode	4160V Switchgear GND Bus		
Facility Ground Electrode	System Neutral		
Facility Ground Electrode	600V Switchgear GND Bus		
Facility Ground Electrode	MCC : GND Bus		
Facility Ground Electrode	MCC : GND Bus		
Facility Ground Electrode	Other :		
Facility Ground Electrode	Other :		
Facility Ground Electrode	Other :		

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** **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

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

Motor Starters	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:											

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

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
Contact Resistance (μΩ)			
Disconnect / Breaker / MCP Resistance (μΩ)			
Fuse Resistance (μΩ)			

Test Summary

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

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:		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** **VOLTAGE MONITOR, SSAC-WVM**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Relay Data		
	Location:	Cell #:
	Manufacturer:	Model:
	Type:	Serial No.:
	Comments:	

Visual Inspection		**A**	**B**	**C**		**A**	**B**	**C**
	Moisture/Rust:				Relay Cleaned:			
	Over-heating:				Screws Tightened:			
	Cover/Case:							
	Legend: A-Acceptable C-Corrected N-Needs Repair NA-Not Applicable							
	Comments:							

Relay Settings	**Parameter**	**Setting (As Found)**	**Setting (As Left)**
	Line Voltage		
	Unbalance		
	Trip Delay		
	Restart Delay		
	Mode Switch		

Basic Voltage Tests	**Desired Phase Voltage**			**Actual Voltage**			**Relay State**	**Time to Change**	**OK**
	A	**B**	**C**	**A**	**B**	**C**			
	600	600	600						
	0	600	600						
	600	600	600						
	600	0	600						
	600	600	600						
	600	600	0						
	600	600	600						
	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				

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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				

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Winnipeg	**INSPECTION FORM** **TRANSFORMER, LIQUID-FILLED, MEDIUM VOLTAGE**	Page: 1 of 3 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Transformer Data										
KVA: / /		Phase:		Primary Voltage: V		Secondary Voltage: V				
Manufacturer:			Model:			Serial Number:				
Primary Winding: ☐ Δ ☐ Y		Secondary Winding: ☐ Δ ☐ Y		Impedance: %Z		Temp Rise: ℃		K Factor:		
Cooling: ☐ ONAN ☐ ONAF		# Cooling Fans:		Winding Material:		Oil Type:				
BIL Rating Primary:			BIL Rating Secondary:			Oil Capacity:				
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			Liquid Level Correct: ☐ Yes ☐ No	
Ground Conductor Size:			Radiators: ☐ Good ☐ Acceptable ☐ Poor	
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):	
Gauges:	Cooling Temperature: Current °C Maximum: °C			Coolant Level:	
	Pressure/Vacuum:			Other:	
Thermographic Inspection Performed:	☐ Yes Attach report separately		Results: ☐ No Issues Found ☐ Potential Issue Identified.		

Insulation Resistance

Winding Temperature: °C Temperature Correction Factor (20°C):

Time	Resistance (MΩ)					
	PRI-GND		SEC-GND		PRI-SEC	
	Test Voltage:		Test Voltage:		Test Voltage:	
	Reading	Corrected to 20°C	Reading	Corrected to 20°C	Reading	Corrected to 20°C
1 min.						
2 min.						
3 min.						
4 min.						
5 min.						
6 min.						
7 min.						
8 min.						
9 min.						
10 min.						
Polarization Index						

Winding Resistance

Winding Temperature: °C

Winding	Winding Resistance (mΩ)	Winding	Winding Resistance (mΩ)
H2 – H1		X0 – X1	
H3 – H2		X0 – X2	
H3 – H1		X0 – X3	

Turns Ratio Test

Tap (Designated)	Primary Voltage (V)	Secondary Voltage (V)	Calculated Ratio	Measured Ratios		
				H3 H1 / X0 X1	H1 H2 / X0 X2	H2 H3 / X0 X3

Connection Resistance

Note: Torque check required for all cables. Connection Resistance Test required for cables 250MCM or larger.

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

Insulating Liquid Tests	Dielectric Breakdown Voltage:	Colour:
	Acid Neutralization Number:	Visual Condition:
	Specific Gravity:	Power Factor or Dissipation Factor:
	Dissolved Gas Analysis:	Other:

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				

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