



RETURN BIDS TO:

RETOURNER LES SOUMISSIONS À:

Bid Receiving - PWGSC / Réception des soumissions
- TPSGC

11 Laurier St. / 11, rue Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2

Gatineau
Quebec
K1A0S5

Bid Fax: (819) 997-9776

Revision to a Request for a Standing Offer

Révision à une demande d'offre à commandes

National Master Standing Offer (NMSO)

Offre à commandes principale et nationale (OCPN)

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Offer remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'offre demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Marine Emergency Response Division/Division des
Interventions en cas d'urgence maritime
Centennial Towers 7th Floor - 7W11
200 Kent Street
Ottawa
Ontario
K1A0S5

Title - Sujet AToN - Beacons and Lanterns	
Solicitation No. - N° de l'invitation F7047-231214/A	Date 2023-12-22
Client Reference No. - N° de référence du client F7047-231214	Amendment No. - N° modif. 002
File No. - N° de dossier 012erd.F7047-231214	CCC No./N° CCC - FMS No./N° VME
GETS Reference No. - N° de référence de SEAG PW-\$ERD-012-29226	
Date of Original Request for Standing Offer 2023-12-05	
Date de la demande de l'offre à commandes originale	
Solicitation Closes - L'invitation prend fin at - à 02:00 PM Eastern Standard Time EST on - le 2024-01-26 Heure Normale du l'Est HNE	
Address Enquiries to: - Adresser toutes questions à: LeFrank, Drew	Buyer Id - Id de l'acheteur 012erd
Telephone No. - N° de téléphone (902) 483-0719 ()	FAX No. - N° de FAX () -
Delivery Required - Livraison exigée	
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: See herein	
Security - Sécurité This revision does not change the security requirements of the Offer. Cette révision ne change pas les besoins en matière de sécurité de la présente offre.	

Instructions: See Herein

Instructions: Voir aux présentes

Acknowledgement copy required	Yes - Oui	No - Non
Accusé de réception requis	<input type="checkbox"/>	<input type="checkbox"/>
The Offeror hereby acknowledges this revision to its Offer. Le proposant constate, par la présente, cette révision à son offre.		
Signature	Date	
Name and title of person authorized to sign on behalf of offeror. (type or print) Nom et titre de la personne autorisée à signer au nom du proposant. (taper ou écrire en caractères d'imprimerie)		
For the Minister - Pour le Ministre		

SOLICITATION AMENDMENT 002

This Solicitation Amendment is raised to:

1. Answer questions that were received from industry.
 2. AMENDMENTS TO ANNEX B – ROTATING BEACONS/ARCTIC ROTATING BEACONS TECHNICAL SPECIFICATION OF REQUIREMENTS
 3. AMENDMENTS TO ANNEX C – OMNIDIRECTIONAL BEACONS TECHNICAL SPECIFICATION OF REQUIREMENTS
 4. AMENDMENTS TO ANNEX E – ROTATING BEACONS/ARCTIC ROTATING BEACONS MANDATORY TECHNICAL EVALUATION CRITERIA
 5. AMENDMENTS TO ANNEX F – OMNIDIRECTIONAL BEACONS MANDATORY TECHNICAL EVALUATION CRITERIA
 6. AMENDMENTS TO ANNEX J – BASIS OF PAYMENT
-

1. QUESTIONS AND ANSWERS:

Question 1

Annex B - 3.2 Optical Performance: TR.7 Nominal Range (p.47) and Appendix A M3 (p.92) states: The rotating beacon must have nominal range as identified in ANNEX B Table 3, using 0.74 for transmissivity. Daytime or nighttime

Annex B Table 3 (p.48) lists ranges as in table below.

Category	Nominal Range (nm)
1	15-20
2	20-25
3	>25

Daytime intensities required to meet the stated ranges require minimum of 69 million candelas for 15nm to 3.8 billion candelas for 25nm.

Could CCG consider removing the mention of daytime from TR.7 and Appendix A M3?

Response to Question 1

'Daytime' will be removed.

See amended Annex B.

Question 2

Annex B - Optical Performance: TR.8 Vertical Divergence (p.48) and Annex E, Appendix A - M4 (p.93) states for Category 1: *The rotating beacon must have a vertical divergence of no less than 0.75° above the horizontal and 0.75° below the horizontal.* And for Category 2: *The rotating beacon must have a vertical divergence 2.5° above the horizontal and 2.5° below the horizontal.*

Both vertical divergences must be determined using the 50% point of rated intensity.

For **Category 1** can CCG verify which total vertical divergence is being required? 0.75° or 1.5°? For **Category 2**, Can CCG verify which total vertical divergence is being required? 2.5° or 5.0°?

Response to Question 2

Category 1 total divergence is 1.5°
Category 2 total divergence is 5° (±2.5°)

Category 1: The rotating beacon must have a vertical divergence of no less than 0.75° above the horizontal and 0.75° below the horizontal. Category 2: The rotating beacon must have a vertical divergence 5° (±2.5°).

See amended Annex B.

Question 3

Annex B - Optical Performance: TR.8 Vertical Divergence (p.48) and Annex E, Appendix A - M4 (p.93)

For **Category 2**, if the answer to question 2 is 5.0° total vertical divergence using the 50% point of rated intensity, will CCG accept same vertical divergence as listed in **Category 1**?

As such will CCG accept same vertical divergence as listed in **Category 1**?

Response to Question 3

No, see correction in Response to Question 2.

Question 4

Annex J – Category A - Rotating beacons Table 1 (p.118), and Category B - Arctic Rotating beacons Table 3 (p.124) states vertical divergences of ≥ 0.75° and 2.5° for Configurations 1 through 6.

If answer to question 2 for Category 1 and 2 is 1.5° and 5.0° respectively, could you update vertical divergences listed in the configurations to match? Also note that as stated in Question 2 above, there are no rotating beacons commercially available with requested vertical divergences for Category 2.

Response to Question 4

Basis of Payment will be updated to reflect the corrected vertical divergencies above. See amended Annex J.

Question 5

Annex B - Electrical/Electronic: TR.11 Regulatory (p.48) states: Conforms to CSA C22.2 or equivalent.

However, CSA C22.2 is for safety requirements for electrical equipment for measurement, control, and laboratory use. conformity to CSA has never been a requirement for past tenders.

As such could we ask that requirement for CSA C22.2 be deleted from the tender?

Response to Question 5

This requirement will remain in the solicitation. Equivalent can be met through a written attestation of conformance by an electrical engineer.

Question 6

Annex B Environment: TR.19 Salt air and seawater spray (p.50) states: The rotating beacon must be capable of operating when under continuous exposure to salt air and seawater spray. Add time

Question: Could you clarify what you mean by Add time?

Response to Question 6

REMOVE 'Add Time' – Document error. See amended Annex B.

Question 7

Annex C - Optical Performance TR.8 Vertical Divergence (p.62) and Appendix A M4 (p.103) states:
The omnidirectional beacon must have a vertical divergence of no less than 1.25° above the horizontal and 1.25° below the horizontal. The vertical divergences must be determined using the 50% point of rated intensity.

Can CCG verify which total vertical divergence is being required? 1.25° or 2.5°?

Response to Question 7

TR.8 requires a vertical divergence of 2.5°.

Question 8

If answer to Question 7 is 2.5°, would CCG consider modifying **TR.8** (p.62) and **Appendix A M4** (p.103) to accommodate new vertical divergences of 2.0° for range category 3 and 4 listed below for **TR.7 Nominal Range**? We ask this because at the closest 12nm range, using the law of cosine a 2° vertical divergence would provide approximately 776 meters of visibility vertically from sea level (388 meters of visibility above the horizontal and 388 meters of visibility below the horizontal). Longer range will increase the vertical visibility of the light from sea level. As there are no vessels currently that have bridge heights of 388 meters anything over the 2° would be redundant. Secondly narrower vertical divergence is more power efficient thus allowing for potentially using smaller solar engines if applicable.

Response to Question 8

Yes, please see updated required below.

Table 2 Vertical divergence change request

Category	TR.7 Nominal Nighttime (nm)	TR.8 Current vertical divergence	TR.8 requested vertical divergence
1	<7	2.5o	2.5o
2	7-12	2.5o	2.5o
3	12-17	2.5o	2.0o
4	>17	2.5o	2.0o

3.2 Optical Performance

TR.8 Vertical Divergence:

Category 1 and 2: The omnidirectional beacon must have a vertical divergence of no less than **1.25°** above the horizontal and **1.25°** below the horizontal. The vertical divergences must be determined using the 50% point of rated intensity.

Category 3 and 4: The omnidirectional beacon must have a vertical divergence of no less than **1°** above the horizontal and **1°** below the horizontal. The vertical divergences must be determined using the 50% point of rated intensity.

See amended Annex C.

Question 9

Annex C - 3.3 Electrical/Electronic: TR.11 Power and Energy (p.64) states: *The omnidirectional beacon must operate using a nominal voltage of 12 volts to 48 volts direct current (DC).*

Does CCG want omnidirectional beacons that can operate in the full range of 12 to 48 volts? Or can the omnidirectional beacon operate in one of 12, 24, or 48V to satisfy TR.11?

Response to Question 9

The omnidirectional beacon can operate in one of 12, 24, or 48V to satisfy TR.11
See amended Annex C.

Question 10

Annex D - 3.1 General TR.7 Mounting Provisions (p.78), Appendix A Mandatory Criteria M2 (p. 111) states: The mounting baseplate of the SCOLL Category 1 and 2 must be in accordance with the 150 mm bolt circle in **ANNEX D Figure 2 in Appendix A**

Would CCG accept 200mm bolt circle for Category 1 and 2 to provide uniform mounting pattern for all categories?

Response to Question 10

No, CCG's most common plastic buoy (accounts for approximately 70% of CCG plastic buoys), the ORT has a 180mm tower diameter and as such only has 150mm B.C.

Question 11

If 150mm bolt circle is a requirement, would CCG accept built in adapter plate that allows 200mm to 150mm bolt circle?

Response to Question 11:

No, CCG would not accept an adapter.

Question 12 :

In previous tenders for SCOLL, CCG has allowed for partial bids, e.g. not bid on every category listed. Will CCG allow for partial bids for the Self-contained LED lanterns category?

Response to Question 12 :

No, Standing Offers will be awarded on a *By Category* basis and an offer must meet all requirements within their offered category.

Question 13

Annex E - Appendix A, Mandatory Criteria – M5 (p.93,94),

Annex F - Appendix A, Mandatory Criteria – M5 (p.102, 103),

Annex G - Appendix A, Mandatory Criteria – M5 (p.112),

state as **Method of Compliance:** *The Bid must include test data as dictated in the performance specification, test data from an independent laboratory via an Industry Standard Test to validate that this requirement has been met.*

In the past in-house testing was accepted as long as they were conducted to the performance specifications referenced in the respective TRs. Will CCG accept in-house testing for **TSOR IDs** found within Mandatory Criteria M5's?

Response to Question 13

CCG will not accept in-house testing – Criteria will remain the same.

Question 14

Annex D - 3.3 Electrical/Electronic TR12 & TR13 (p.79) Autonomy Type A & B lanterns, Reference: TR.2 Isolation Data (p.76)

Could CCG amend TR.12 and TR.13 and add "solar calculations to determine autonomy days are done using the IALA Solar Sizing program (Excel) as stated in the IALA Guideline G1039 Ed.2.0 2017 DESIGNING SOLAR POWER SYSTEMS FOR MARINE AIDS TO NAVIGATION (SOLAR SIZING TOOL)?" in order to ensure autonomy calculations are done uniformly for consideration by CCG. Please note we are requesting the use of the above IALA Guideline as this tender set precedent by citing IALA Recommendation E-200 in Table 8 (p.54) and other sections of the tender, as well as that IALA is the international authority pertaining to setting various Guidelines, Standards, and Recommendations used by marine authorities around the world including CCG.

Response to Question 14

This will not be amended. Canada to review and assess calculations during bid evaluation. Bids will be evaluated against Part 4 – Evaluation Procedures of the Request for Standing Offer.

Question 15

Annex J - Basis of Payment

Category A – Rotating Beacons Table 1 configuration 1,3, 6 states vertical divergence of $\geq 0.75^\circ$ and configurations 2, 4, and 6 states vertical divergence of 2.5o however in **Annex A – Statement of Work, Annex B – Technical Statement of Requirements, Rotating Beacons, Mandatory Criteria** these configurations are not mentioned.

- a. Can we assume Configuration 1,3, and 5 is referring to Category 1 as stated in **TR.8** (p.48) found in Rotating Beacons/Arctic Rotating Beacons?
- b. can we assume Configuration 2,4, and 6 is referring to Category 2 as stated in **TR.8** (p.48) found in Rotating Beacons/Arctic Rotating Beacons?

Response to Question 15

- a. Yes
- b. Yes

Question 16

In order to accurately calculate Firm Unit Prices (Annex J – Basis of Payment) as requested in Section 4.1.3 Financial Evaluation (p.18) Delivered Duty Paid, can CCG provide specific ship to addresses for each site listed on all four Categories, including postal codes in Tables 2 (p.118), 4 (p.124), 6 (p.130), and 8 (p.136) in Annex J – Bases of Payment?

Response to Question 16

As the Standing Offer(s) will be authorized for use by any government department and authorized CCPI users, ship to addresses are non-specific and will remain as the given locations.

Question 17

Would it be possible for CCG to provide approximate quantities of beacons requested for each Categories per annual basis? This has been provided in previous tenders, such as previous SCOLL tender.

Response to Question 17

Yes, the Basis of Payment will be updated to reflect estimated annual ordering quantities by configuration.
See amended Annex J.

2. AMENDMENTS TO ANNEX B – ROTATING BEACONS/ARCTIC ROTATING BEACONS TECHNICAL SPECIFICATION OF REQUIREMENTS

Delete: Annex B in its entirety.
Insert: Annex B as attached
Amended TSOR IDs are as follows:
- TR.7, TR.8, TR.19

3. AMENDMENTS TO ANNEX C – OMNIDIRECTIONAL BEACONS TECHNICAL SPECIFICATION OF REQUIREMENTS

Delete: Annex C in its entirety.
Insert: Annex C as attached
Amended TSOR IDs are as follows:
- Table 3, TR.8, TR.11

4. AMENDMENTS TO ANNEX E – ROTATING BEACONS/ARCTIC ROTATING BEACONS MANDATORY TECHNICAL EVALUATION CRITERIA

Delete: Annex E in its entirety.
Insert: Annex E as attached
Amended MTEC IDs are as follows:
- M3, M4

5. AMENDMENTS TO ANNEX F – OMNIDIRECTIONAL BEACONS MANDATORY TECHNICAL EVALUATION CRITERIA

Delete: Annex F in its entirety.
Insert: Annex F as attached
Amended MTEC IDs are as follows:
- M4

6. AMENDMENTS TO ANNEX J – Basis of Payment

Delete: Annex J in its entirety.
Insert: Annex J as attached
Annex J amended as follows:
- Instructions to Offerors, Tables 1,3,5, and 7

Solicitation No. - N° de l'invitation
F7047-231214/A
Client Ref. No. - N° de réf. du client
F7047-231214/A

Amd. No. - N° de la modif.
002
File No. - N° du dossier

Buyer ID - Id de l'acheteur
012erd
CCC No./N° CCC - FMS No./N° VME

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

Rotating Beacons/Arctic Rotating Beacons

Category A/Category B

Technical Specification of Requirements

Annex B



Table of Contents

1. INTRODUCTION	1
1.1. PURPOSE	1
1.2. DOCUMENT CONVENTION	1
2. REFERENCED PUBLICATIONS, SPECIFICATIONS AND STANDARDS.....	2
2.1. PRIORITY OF DOCUMENTS.....	2
2.2. REFERENCE DOCUMENTS.....	2
3. TECHNICAL REQUIREMENTS.....	3
3.1. GENERAL.....	3
3.2. OPTICAL PERFORMANCE.....	4
3.3. ELECTRICAL/ELECTRONIC	5
3.4. ENVIRONMENT.....	7
3.5. SERVICE LIFE	8
APPENDIX A REFERENCED FIGURES.....	9
APPENDIX B REFERENCED DOCUMENTS	10

List of Tables

Table 1: General specifications.....	3
Table 2: Optical specifications	4
Table 3: Nominal Range	5
Table 4: Electrical/electronic specifications.....	5
Table 5: Environmental specifications.....	7
Table 6: Life cycle specifications	8
Table 7: Referenced Publications, Specifications and Standards.....	10
Table 8: Other Referenced Documents.....	10

List of Figures

Figure 1: Mounting Hole Clearance Requirement 9

Abbreviations

Abbreviation	Definition
CCG	Canadian Coast Guard
cd	Candelas
DFO	Fisheries and Oceans Canada
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IEC	International Electrotechnical Commission
IHO	International Hydrographic Organization
IP	Ingress Protection
kg	Kilograms
LED	Light Emitting Diode
lx	Lux
m	Meters
MIL STD	US Military Standard
nm	Nautical miles
NOTMAR	Notice to mariners
SCOLL	Self-Contained LED Lantern
TR	Technical Requirement
TSoR	Technical Specification of Requirements

1. Introduction

1.1. Purpose

This document is used for the purchase of commercial off-the-shelf Rotating Beacons for the use as marine aids to navigation by the Canadian Coast Guard (CCG).

The CCG considers a rotating beacon to be a lantern with a narrow beam of light designed to rotate 360° so it can be seen from all approaching directions. The lanterns are deployed in a marine environment and will be exposed to a wide variety of temperatures, humidity, wind speeds, sea spray, and ice loads. These lanterns will be left unattended for up to five years at a time.

1.2. Document Convention

The following convention applies to the Technical Specification of Requirements (TSOR):

- 1) The term **MUST** is used to identify mandatory requirements that are to be satisfied by the Contractor and approved by Canada.

2. Referenced Publications, Specifications and Standards

2.1. Priority of Documents

In the event of any conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been made.

2.2. Reference Documents

The documents listed in Appendix B are referenced in Section 3 of this specification.

3. Technical Requirements

3.1. General

Table 1: General specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.1	Fundamental design	<ul style="list-style-type: none"> The Rotating Beacon must use LED(s) as a light source. The rotating beacon must produce a flash through mechanical rotation of at least one optical element in order to create a “sweeping” light effect.
TR.2	Material	<ul style="list-style-type: none"> The rotating beacon must be made of materials which will not be subject to damage due to corrosion or rust during the life expectancy of the rotating beacon. The rotating beacon must not contain any toxic or radioactive materials which could harm human health and/or the environment.
TR.3	Finish	<ul style="list-style-type: none"> External components must have a smooth finish and be uniform in colour and appearance. The lens must maintain IALA (Table 8, item 5) colour requirements for no less than 8 years. Ultraviolet exposure must cause minimal material breakdown of the housing so the unit maintain structural integrity for no less than 8 years. All components of the rotating must be free of cracks, burrs, sharp edges, and other defects and blemishes that could affect their life, appearance, and serviceability.
TR.4	Protection from birds	<ul style="list-style-type: none"> The rotating beacon must have a means of restricting the ability of birds to roost on it.
TR.5	Mounting provisions	<ul style="list-style-type: none"> The rotating beacon must have a mounting plate with pre-drilled holes to allow mounting to a flat surface with standard nuts and bolts. The bottom of the rotating beacon base must be parallel to range light’s focal plane.

Reference Number	Description of the Criteria	Requirement or Value
		<ul style="list-style-type: none"> Any part of the rotating beacon that overhangs the mounting holes shall be no less than 72.5mm above the mounting foot to allow use of a 1 inch bolt and wrench. Refer to Figure 1 below in Appendix A.
TR.6	Identification nameplate	<ul style="list-style-type: none"> The rotating beacon must have an identification nameplate with the following information: <ul style="list-style-type: none"> Name of manufacturer Model number Serial Number Date of Manufacture Rated Voltage/ Amperage The identification nameplate must be indelible. The identification nameplate must be located on the exterior of the unit The identification nameplate must be located on the exterior of the unit

3.2. Optical Performance

Table 2: Optical specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.7	Nominal range	<ul style="list-style-type: none"> The rotating beacon must have nominal range as identified in Table 3: Nominal Range. using 0.74 for transmissivity for nighttime. The rotating beacon must have adjustable intensities.
TR.8	Vertical divergence	<ul style="list-style-type: none"> Category 1: The rotating beacon must have a vertical divergence of no less than 0.75° above the horizontal and 0.75° below the horizontal. Category 2: The rotating beacon must have a vertical divergence 5° (±2.5°). <p>Note: The vertical divergence must be determined using the 50% point of rated intensity.</p>

Reference Number	Description of the Criteria	Requirement or Value
TR.9	Flash characteristics	<ul style="list-style-type: none"> The rotating beacon must be capable of producing the common flashing (Fl.) as listed in the Canadian Coast Guard List of Lights, Buoys and Fog Signals (Reference: Table 8).
TR.10	Signal colours	<ul style="list-style-type: none"> The light signal provided by green, red, and white beacons must fall within the chromaticity regions of IALA E-200 (reference: Table 8).

Table 3: Nominal Range

Category	Nominal Range (nm)
1	15-20
2	20-25
3	>25

3.3. Electrical/Electronic

Table 4: Electrical/electronic specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.11	Regulatory	<ul style="list-style-type: none"> Conforms to CSA C22.2 or equivalent
TR.12	Power and energy	<ul style="list-style-type: none"> The rotating beacon must operate using a nominal voltage of 12 volts, or 24 volts, or 48 volts direct current (DC). The rotating beacon must operate within standard input ranges for the stated voltage. The rotating beacon must be capable of incorporating an alternating current (AC) to DC converter if requested by the CCG.
TR.13	Protection	<ul style="list-style-type: none"> The rotating beacon must be provided with reverse polarity protection and not experience damage if the power leads are connected in reverse polarity. The rotating beacon must be provided with short-circuit protection with automatic reset.

Reference Number	Description of the Criteria	Requirement or Value
TR.14	Control	<ul style="list-style-type: none"><li data-bbox="779 262 1404 367">• The rotating beacon must provide a means of programming the flash characteristics by the CCG personnel.<li data-bbox="779 378 1404 483">• The rotating beacon must maintain its programmed setting for no less than 12 months unpowered (storage conditions).

3.4. Environment

The following requirements must be tested in accordance with MIL-STD-810G, IEC 60945, IEC60529 or an equivalent test plan submitted for approval.

Table 5: Environmental specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.15	Temperature	<ul style="list-style-type: none"> Category A: The rotating beacon must be capable of operating when exposed to temperatures ranging from -30 °C to +40 °C. Category B: The rotating beacon must be capable of operating when exposed to temperatures ranging from -35 °C to +40 °C.
TR.16	Humidity	<ul style="list-style-type: none"> The rotating beacon must be capable of operating when exposed to relative humidity from 0% to 100% condensing.
TR.17	Icing	<ul style="list-style-type: none"> The rotating beacon must be capable of operating when exposed to ice loading up to 20 kg/m².
TR.18	Wind speed	<ul style="list-style-type: none"> The rotating beacon must be capable of operating when exposed to wind speeds up to 160 km/h.
TR.19	Salt air and seawater spray	<ul style="list-style-type: none"> The rotating beacon must be capable of operating when under continuous exposure to salt air and seawater spray.
TR.20	Electromagnetic interference	<ul style="list-style-type: none"> The rotating beacon must not be susceptible to interference from radiating devices normally found in the marine environment when tested in accordance with IEC 60945 (Reference: Table 7).
TR.21	Static discharge	<ul style="list-style-type: none"> The rotating beacon must incorporate protection from static discharges and induced transient voltages on power leads that may occur due to nearby lightning strikes when tested in accordance with IEC 60945 (Reference: Table 7).
TR.22	Shock	<ul style="list-style-type: none"> The rotating beacon must remain operational after a shock event as outlined in MIL-STD-810G Method 516.6 Procedure I – Functional Shock (Reference: Table 7).

Reference Number	Description of the Criteria	Requirement or Value
TR.23	Immersion protection	<ul style="list-style-type: none"> The rotating beacon must meet ingress protection of at least IP65 in accordance with IEC 60529:1989+AMD1:1999+AMD2:2013 and CSV/COR2:2015 (Reference: Table 7).

3.5. Service Life

Table 6: Life cycle specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.24	Lumen depreciation	<ul style="list-style-type: none"> The light source must have a minimum L₇₀ rating of 50 000 hours.

Appendix A Referenced Figures

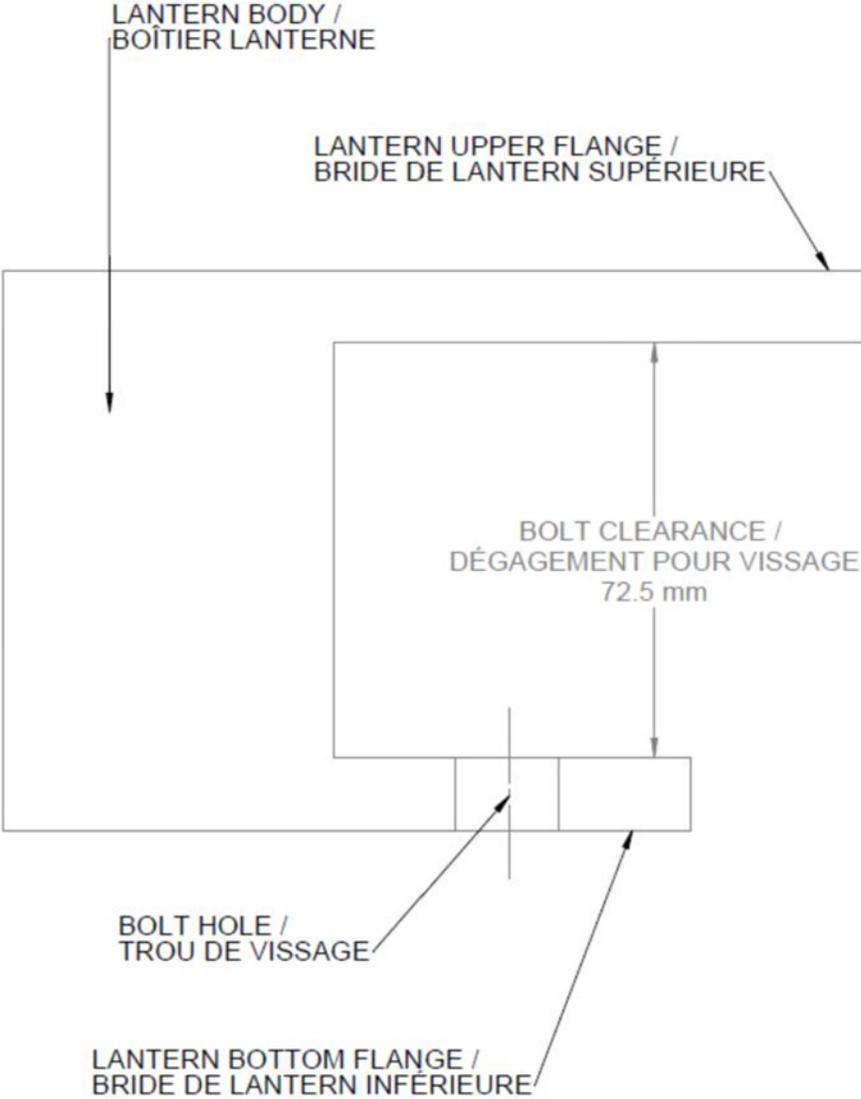


Figure 1: Mounting Hole Clearance Requirement

Appendix B Referenced Documents

The documents listed in this appendix are to be referenced in Section 2 of this specification. This section does not include documents cited in other sections of this specification. The following is a sample list of standards to adhere to in the manufacturing of these buoys. Vendors/manufacturers are to meet the most recent version of each standard.

Table 7: Referenced Publications, Specifications and Standards

1.	IEC 60529: 1989 +AMD1 : 1999 + AMD2 :2013 and CSV/ COR2: 2015	Degrees of protection provided by enclosures (IP Code).
2.	IEC 60945 4 th edition	Maritime Navigation and Radiocommunication Equipment and Systems – General Requirements – Methods of Testing and Required Test Results.
3.	MIL-STD-202H	Department of Defense Test Method Standard: Electronic and Electrical Component Parts.
4.	MIL-STD-810G	Environmental Engineering Considerations and Laboratory Tests.

Table 8: Other Referenced Documents

5.	IALA Recommendation E- 200	Marine Signal Lights Edition 1 December 2008
6.	Canadian Coast Guard	Notice to Mariners (NOTMAR) List of Lights, Buoys and Fog Signals (4 Volumes) – https://www.notmar.gc.ca/list-livre-en.php

Omnidirectional Beacons

Category C Technical Specification of Requirements Annex C



Table of Contents

1. INTRODUCTION.....	1
1.1. PURPOSE.....	1
1.2. DOCUMENT CONVENTION.....	1
2. REFERENCED PUBLICATIONS, SPECIFICATIONS AND STANDARDS	2
2.1. PRIORITY OF DOCUMENTS	2
2.2. REFERENCE DOCUMENTS	2
3. TECHNICAL REQUIREMENT.....	3
3.1. GENERAL	3
3.2. OPTICAL PERFORMANCE.....	4
3.3. ELECTRICAL/ELECTRONIC	5
3.4. ENVIRONMENT.....	6
3.5. SERVICE LIFE.....	7
APPENDIX A REFERENCED FIGURES	8
APPENDIX B REFERENCED DOCUMENTS	10

List of Tables

Table 1: General specifications	3
Table 2: Optical specifications.....	4
Table 3: Nominal Range	5
Table 4: Electrical/electronic specifications	5
Table 5: Environmental specifications	6
Table 6: Life cycle specifications	7
Table 7: Referenced Publications, Specifications and Standards.....	10
Table 8: Other Referenced Documents.....	10

List of Figures

Figure 1: Mounting Hole Clearance Requirement.....	8
Figure 2: CCG Mounting Hole Pattern.....	9

Abbreviations

Abbreviation	Definition
CCG	Canadian Coast Guard
cd	Candelas
DFO	Fisheries and Oceans Canada
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IEC	International Electrotechnical Commission
IHO	International Hydrographic Organization
IP	Ingress Protection
kg	Kilograms
LED	Light Emitting Diode
lx	Lux
m	Meters
MIL STD	US Military Standard
nm	Nautical miles
NOTMAR	Notice to mariners
SCOLL	Self-Contained LED Lantern
TR	Technical Requirement
TSoR	Technical Specification of Requirements

1. Introduction

1.1. Purpose

This document is used for the purchase of commercial off-the-shelf Omnidirectional Beacons for the use as marine aids to navigation by the Canadian Coast Guard (CCG). The CCG makes use of red, green, yellow, and white lanterns of common aid to navigation light flash characteristics as detailed in CCG Notice to Mariners (NOTMAR) List of Lights, Buoys and Fog Signals.

The CCG considers a omnidirectional beacon to be a lantern designed to operate in conjunction with existing or purpose-built power supplies. The lanterns are deployed in a marine environment and will be exposed to a wide variety of temperatures, humidity, wind speeds, sea spray, and ice loads. These lanterns will be deployed for up to five years at a time.

1.2. Document Convention

The following convention applies to the Technical Specification of Requirements (TSOR):

- 1) The term **MUST** is used to identify mandatory requirements that are to be satisfied by the Contractor and approved by Canada.

2. Referenced Publications, Specifications and Standards

2.1. Priority of Documents

In the event of any conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been made.

2.2. Reference Documents

The documents listed in Appendix B are referenced in Section 3 of this specification.

3. Technical Requirement

3.1. General

Table 1: General specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.1	Fundamental design	<ul style="list-style-type: none">The omnidirectional beacon must use LED(s) as a light source.
TR.2	Material	<ul style="list-style-type: none">The omnidirectional beacon must be made of materials which will not be subject to damage due to corrosion or rust during the life expectancy of the omnidirectional beacon.The omnidirectional beacon must not contain any toxic or radioactive materials which could harm human health and/or the environment.
TR.3	Finish	<ul style="list-style-type: none">External components must have a smooth finish and be uniform in colour and appearance.The lens must maintain IALA (Table 8, item 4) colour requirements for no less than 8 years.Ultraviolet exposure must cause minimal material breakdown of the housing so the unit maintain structural integrity for no less than 8 years.All components of the omnidirectional beacon must be free of cracks, burrs, sharp edges, and other defects and blemishes that could affect their life, appearance, and serviceability.
TR.4	Protection from birds	<ul style="list-style-type: none">The omnidirectional beacon must have a means of restricting the ability of birds to roost on it.
TR.5	Mounting provisions	<ul style="list-style-type: none">The bottom of the omnidirectional beacon base must be parallel to the light's focal plane.Any part of the omnidirectional beacon that overhangs the mounting holes shall be no less than 72.5mm above the mounting foot. Refer to Figure 1 below in Appendix A.The mounting baseplate for the omnidirectional beacon must be in accordance

Reference Number	Description of the Criteria	Requirement or Value
		with the 200 mm bolt circle in Figure 2 in Appendix A.
TR.6	Identification nameplate	<ul style="list-style-type: none"> • The omnidirectional beacon must have an identification nameplate with the following information: <ol style="list-style-type: none"> a) Name of manufacturer b) Model number c) Serial Number d) Date of Manufacture (YYYY-MM-DD) e) Rated Voltage/ Amperage • The identification nameplate must be indelible. • The identification nameplate must be located on the exterior of the unit.

3.2. Optical Performance

Table 2: Optical specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.7	Nominal range	<ul style="list-style-type: none"> • The omnidirectional beacon must have nominal nighttime range as identified in Table 3. • The omnidirectional beacon must have an optional step-down function to allow for reduced intensity during nighttime operations.
TR.8	Vertical divergence	<ul style="list-style-type: none"> • Category 1 and 2: The omnidirectional beacon must have a vertical divergence of no less than 1.25° above the horizontal and 1.25° below the horizontal. • Category 3 and 4: The omnidirectional beacon must have a vertical divergence of no less than 1° above the horizontal and 1° below the horizontal. <p>Note: The vertical divergence must be determined using the 50% point of rated intensity.</p>
TR.9	Flash characteristics	<ul style="list-style-type: none"> • The omnidirectional beacon must be capable of producing the common flashing (Fl.) as listed in the Canadian Coast Guard List of

Reference Number	Description of the Criteria	Requirement or Value
		Lights, Buoys and Fog Signals (Reference: Table 8).
TR.10	Signal colours	<ul style="list-style-type: none"> The light signal provided by green, red, white, and yellow beacons must fall within the chromaticity regions of IALA E-200 (Reference: Table 8).

Table 3: Nominal Nighttime Range

Category	Nominal Range (nm)	Vertical Divergence
1	<7	2.5°
2	7-12	2.5°
3	12-17	2.0°
4	>17	2.0°

3.3. Electrical/Electronic

Table 4: Electrical/electronic specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.11	Power and energy	<ul style="list-style-type: none"> The omnidirectional beacon must operate using a nominal voltage either, 12v, or 24v, or 36v or 48v direct current (DC). The omnidirectional beacon must operate within standard input ranges for the stated voltage. The omnidirectional beacon must be capable of incorporating an alternating current (AC) to DC converter if requested by the CCG.
TR.12	Protection Requirements	<ul style="list-style-type: none"> The omnidirectional beacon must have reverse polarity protection and not experience damage if the power leads are connected in reverse polarity. The omnidirectional beacon must have short-circuit protection with automatic reset.

Reference Number	Description of the Criteria	Requirement or Value
TR.13	Control	<ul style="list-style-type: none"> The omnidirectional beacon must provide a means of programming the flash characteristics by the CCG personnel. The omnidirectional beacon must maintain its programmed setting, and will not switch to another setting until programmed to do so for no less than 12 months unpowered (storage conditions).

3.4. Environment

Table 5: Environmental specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.14	Temperature	<ul style="list-style-type: none"> The omnidirectional beacon must be capable of operating when exposed to temperatures ranging from -30 °C to +40 °C.
TR.15	Humidity	<ul style="list-style-type: none"> The omnidirectional beacon must be capable of operating when exposed to relative humidity from 0% to 100% condensing.
TR.16	Icing	<ul style="list-style-type: none"> The omnidirectional beacon must be capable of operating when exposed to ice loading up to 20 kg/m².
TR.17	Wind speed	<ul style="list-style-type: none"> The omnidirectional beacon must be capable of operating when exposed to wind speeds up to 160 km/h.
TR.18	Salt air and seawater spray	<ul style="list-style-type: none"> The omnidirectional beacon must be capable of operating when under continuous exposure to salt air and seawater spray.
TR.19	Electromagnetic interference	<ul style="list-style-type: none"> The omnidirectional beacon must not be susceptible to interference from radiating devices normally found in the marine environment when tested in accordance with IEC 60945. (Reference: Table 7)
TR.20	Static discharge	<ul style="list-style-type: none"> The omnidirectional beacon must incorporate protection from static discharges and induced transient voltages on power leads that may occur due to nearby lightning strikes.

Reference Number	Description of the Criteria	Requirement or Value
TR.21	Shock	<ul style="list-style-type: none"> The omnidirectional beacon must remain operational after a shock event as outlined in MIL-STD-810G Method 516.6 Procedure I – Functional Shock. (Reference: Table 7)
TR.22	Immersion protection	<ul style="list-style-type: none"> The omnidirectional beacon must meet ingress protection of at least IP65 in accordance with IEC 60529:1989+AMD1:1999+AMD2:2013 and CSV/COR2:2015. (Reference: Table 7)

3.5. Service Life

Table 6: Life cycle specifications

Reference Number	Description of the Criteria	Requirement or Value
TR.23	Lumen depreciation	<ul style="list-style-type: none"> Omnidirectional beacons must have a minimum L₇₀ rating of 50 000 hours.

Appendix A REFERENCED FIGURES

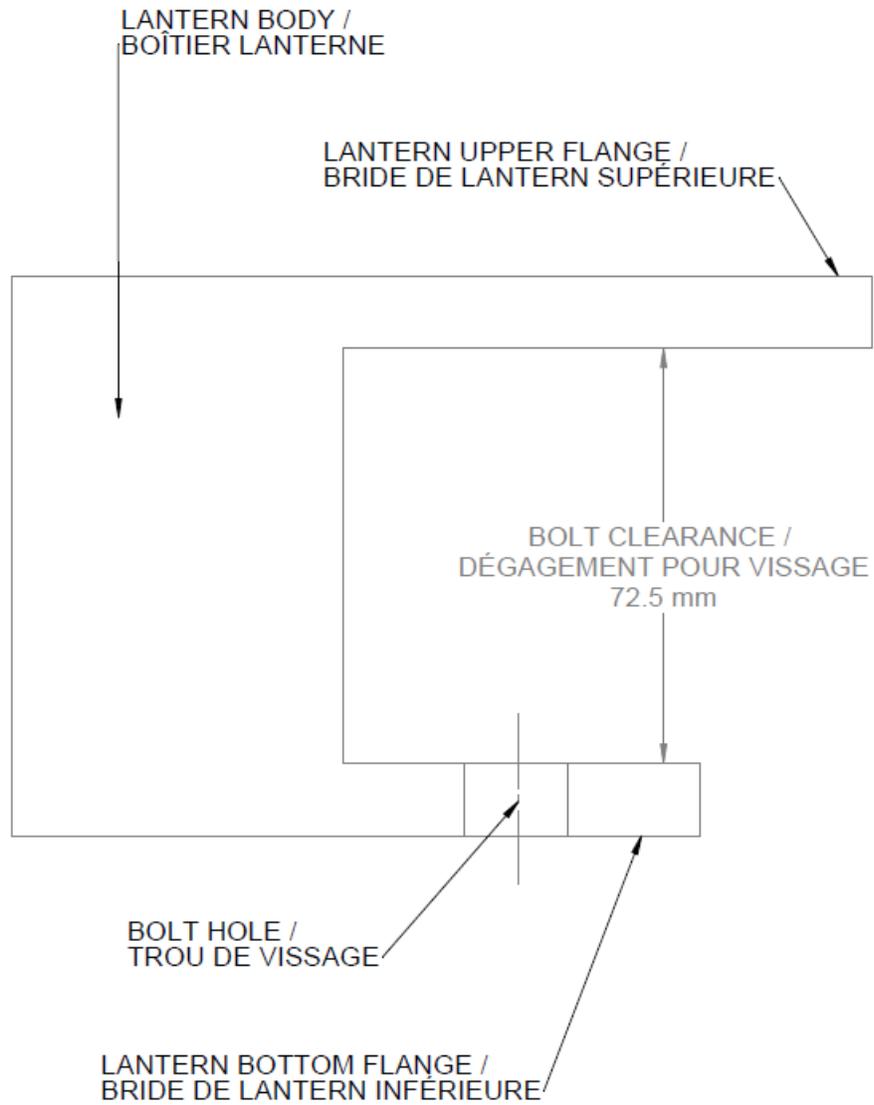
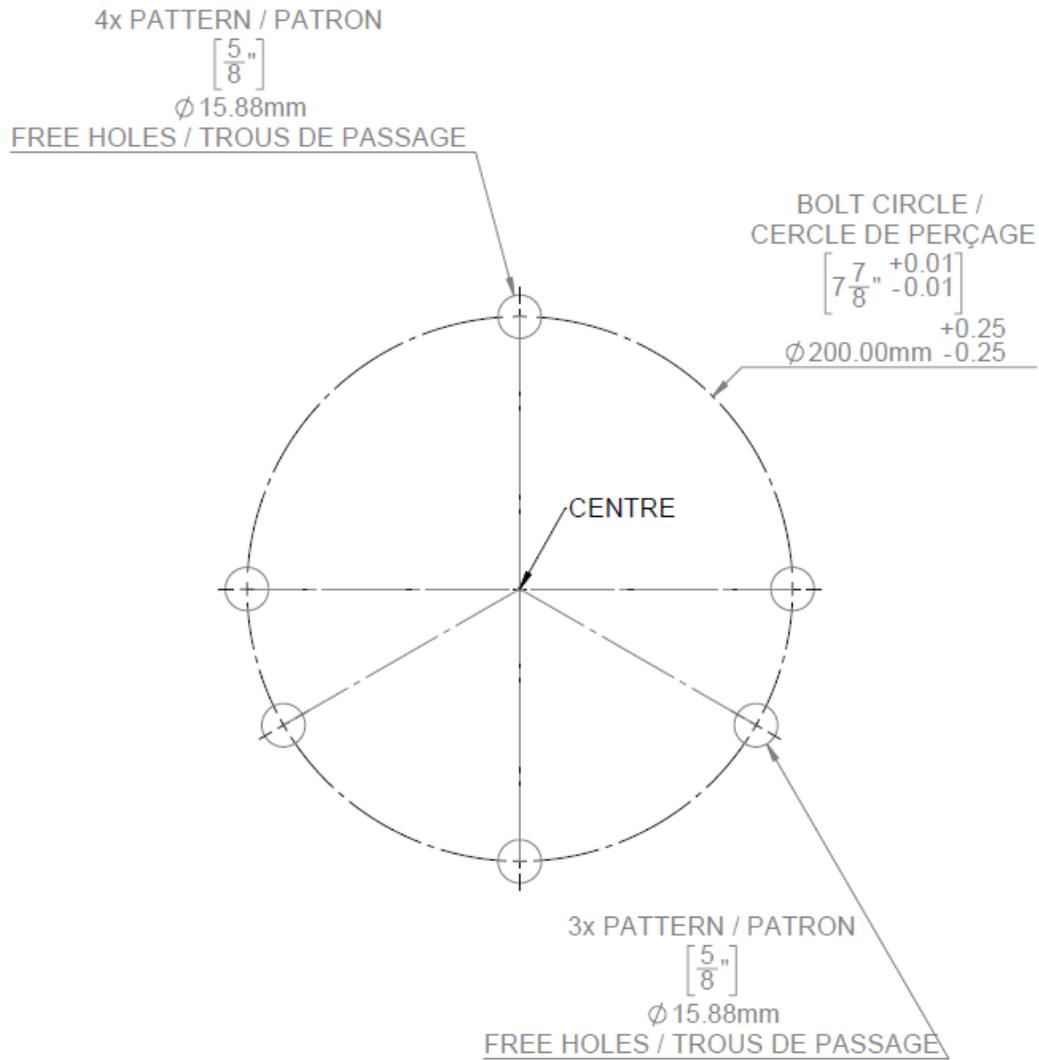


Figure 1: Mounting Hole Clearance Requirement



CCG STANDARD MOUNTING PATTERNS /
 CERCLES DE MONTAGE STANDARDS DE LA GCC

Figure 2: CCG Mounting Hole Pattern

Appendix B REFERENCED DOCUMENTS

The documents listed in this appendix are to be referenced in Section 2 of this specification. This section does not include documents cited in other sections of this specification. The following is a sample list of standards to adhere to in the manufacturing of these buoys. Vendors/manufacturers are to meet the most recent version of each standard.

Table 7: Referenced Publications, Specifications and Standards

1.	IEC 60529: 1989 +AMD1 : 1999 + AMD2 :2013 and CSV/ COR2: 2015	Degrees of protection provided by enclosures (IP Code).
2.	MIL-STD-202H	Department of Defense Test Method Standard: Electronic and Electrical Component Parts.
3.	MIL-STD-810G	Environmental Engineering Considerations and Laboratory Tests.

Table 8: Other Referenced Documents

4.	IALA Recommendation E-200	Marine Signal Lights Edition 1 December 2008
5.	Canadian Coast Guard	Notice to Mariners (NOTMAR) List of Lights, Buoys and Fog Signals (4 Volumes) – https://www.notmar.gc.ca/list-livre-en.php

**Rotating Beacons/
Arctic Rotating Beacons
Category A/Category B
Mandatory Technical Evaluation Criteria
Annex E**



Table of Contents

1. INTRODUCTION.....	1
1.1. OFFEROR PURPOSE	1
2. REFERENCE DOCUMENTATION.....	2
2.1. GENERAL CONSIDERATIONS.....	2
a. <i>Appendix A – Mandatory Criteria – Part 1 of 2, M1; and</i>	2
b. <i>Appendix A – Mandatory Criteria – Part 2 of 2, M2 to M5.</i>	2
2.2. GUIDELINES FOR APPENDIX A – MANDATORY CRITERIA – PART 1 OF 2	2
2.3. GUIDELINES FOR APPENDIX A – MANDATORY CRITERIA – PART 2 OF 2	2
APPENDIX A MANDATORY CRITERIA.....	4
1. MANDATORY CRITERIA – PART 1 OF 2.....	4
2. MANDATORY CRITERIA – PART 2 OF 2.....	4

1. Introduction

1.1. Offeror Purpose

The document defines the methodology that will be used to evaluate the technical portion of each Bid submitted in response to the Solicitation for the procurement of Rotating Beacons.

2. Reference Documentation

2.1. General Considerations

The technical portion of the Bid will be evaluated against the following mandatory criteria (M) specified herein:

- a. Appendix A – Mandatory Criteria – **Part 1 of 2, M1**; and
- b. Appendix A – Mandatory Criteria – **Part 2 of 2, M2 to M5**.

2.2. Guidelines for Appendix A – Mandatory Criteria – Part 1 of 2

- 1) The Bidder’s authorized representative must initial in the ‘Initials’ column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 1 of 2.
- 2) The Bidder must respond with a ‘Yes’ or ‘No’ in the ‘Compliant (Y/N)?’ column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 1 of 2.
- 3) The following line item example is provided to demonstrate how to populate Appendix A – Mandatory Criteria – Part 1 of 2.

Item No.	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M1	All requirements stipulated in Annex A (Statement of Work) will be met.	Annex A (SOW) Annex B (TSOR)	The Bidder must include a Certificate of Compliance (Annex X of the Bid Solicitation) signed by an authorized representative.	Yes	JD	<i>Page 5 of the Bid</i>

2.3. Guidelines for Appendix A – Mandatory Criteria – Part 2 of 2

- 1) Various methods of compliance are listed in Appendix A – Mandatory Criteria –Part 2 of 2. The Bidder must carefully read the requested method(s) of compliance, as each method of compliance may differ between the mandatory criteria.
- 2) For a given criterion, the Bidder must provide ALL information requested to sufficiently demonstrate compliance, and cross-reference the appropriate location(s) within the Bid where such information can be found.
- 3) The Bidder’s authorized representative must initial in the ‘Initials’ column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 2 of 2.

- 4) The Bidder must respond with a 'Yes' or 'No' in the 'Compliant (Y/N)?' column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 2 of 2..
- 5) Failure to provide the requested information as per the defined method(s) of compliance and initial any given criterion will render that criterion Non-Compliant.
- 6) The following fictitious line item example is provided to demonstrate how to populate Appendix A – Mandatory Criteria – Part 2 of 2.

Item No.	Intent of Requirement	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M2	Show that the proposed lantern will comply with Annex A	The proposed lantern must satisfy the defined design and construction requirements.	Annex B (TSOR)	The Bidder must include technical data that demonstrates compliance with the requirements detailed in Annex A.	Yes	JD	<i>Section 4 – page 88 of the Bid</i>

Appendix A Mandatory Criteria

1. Mandatory Criteria – Part 1 of 2

Item No.	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M1	All requirements stipulated in Annex A (SOW - Statement of Work) and Annex B (TSOR - Technical Statement of Requirements) will be met.	Annex A (SOW) Annex B (TSOR)	The Bidder must include a Certificate of Compliance (Annex 2 to Part 4 of the Bid Solicitation) signed by an authorized representative.			

2. Mandatory Criteria – Part 2 of 2

Item No.	Intent of Requirement	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M2	Show that the proposed lantern will comply with Annex A	The Bidder must provide technical documentation for the proposed rotating beacon to demonstrate the mandatory mounting provisions requirement. TSOR ID: TR.5 <ul style="list-style-type: none"> The rotating beacon must have a mounting plate with pre-drilled 	Annex B (TSOR)	The Bid must include technical data to demonstrate compliance. Technical data may include brochures, Data Sheets or OEM manuals.			

		<p>holes to allow mounting to a flat surface with standard nuts and bolts.</p> <ul style="list-style-type: none"> The bottom of the rotating beacon base must be parallel to range light's focal plane. Any part of the rotating beacon that overhangs the mounting holes shall be no less than 72.5mm above the mounting foot to allow use of a 1 inch bolt and wrench. Refer to ANNEX B Figure 1 in Appendix A. 					
M3	Show that the proposed lantern will comply with Annex A	<p>The Bidder must provide technical documentation for the proposed rotating beacon to demonstrate the mandatory nominal range requirement.</p> <p>TSOR ID: TR.7</p> <ul style="list-style-type: none"> The rotating beacon must have nominal range as identified in ANNEX B Table 3, using 0.74 for transmissivity for nighttime. The rotating beacon must have adjustable intensities. 	Annex B (TSOR)	<p>The Bid must include technical data to demonstrate compliance.</p> <p>Technical data may include brochures, Data Sheets, OEM manuals or Engineering Documentation.</p>			
M4	Show that the proposed lantern will comply with Annex A	<p>The Bidder must provide technical documentation for the proposed rotating beacon to demonstrate the mandatory vertical divergence requirement</p> <p>TSOR ID: TR.8</p>	Annex B (TSOR)	<p>The Bid must include test data with the vertical divergence determined using the 50% point of rated intensity.</p>			

		<ul style="list-style-type: none"> Category 1: The rotating beacon must have a vertical divergence of no less than 0.75° above the horizontal and 0.75° below the horizontal. Category 2: The rotating beacon must have a vertical divergence 5° (±2.5°). 				
M5	Show that the proposed lantern will comply with Annex A	<p>The Bidder must provide technical documentation for the proposed rotating beacon to demonstrate the mandatory technical requirements listed below:</p> <p>TSOR ID: TR.10 The light signal provided by green, red, white, and yellow beacons must fall within the chromaticity regions of IALA E-200</p> <p>TSOR ID: TR.20 The rotating beacon must not be susceptible to interference from radiating devices normally found in the marine environment when tested in accordance with IEC 60945.</p> <p>TSOR ID: TR.22 The rotating beacon must remain operational after a shock event as outlined in MIL-STD-810G Method 516.6 Procedure I – Functional Shock.</p>	Annex B (TSOR)	The Bid must include test data as dictated in the performance specification, test date from an independent laboratory via an Industry Standard Test to validate that this requirement has been met.		

Omnidirectional Beacons

Category C Mandatory Technical Evaluation Criteria Annex F



Table of Contents

1. INTRODUCTION.....	1
1.1. OFFEROR PURPOSE	1
2. REFERENCE DOCUMENTATION.....	2
2.1. GENERAL CONSIDERATIONS.....	2
a. <i>Appendix A – Mandatory Criteria – Part 1 of 2, M1; and</i>	2
b. <i>Appendix A – Mandatory Criteria – Part 2 of 2, M2 to M5.</i>	2
2.2. GUIDELINES FOR APPENDIX A – MANDATORY CRITERIA – PART 1 OF 2	2
2.3. GUIDELINES FOR APPENDIX A – MANDATORY CRITERIA – PART 2 OF 2	2
APPENDIX A MANDATORY CRITERIA.....	4
1. MANDATORY CRITERIA – PART 1 OF 2.....	4
2. MANDATORY CRITERIA – PART 2 OF 2.....	4

1. Introduction

1.1. Offeror Purpose

The document defines the methodology that will be used to evaluate the technical portion of each Bid submitted in response to the Solicitation for the procurement of Omnidirectional Beacons.

2. Reference Documentation

2.1. General Considerations

The technical portion of the Bid will be evaluated against the following mandatory criteria (M) specified herein:

- a. Appendix A – Mandatory Criteria – **Part 1 of 2, M1**; and
- b. Appendix A – Mandatory Criteria – **Part 2 of 2, M2 to M5**.

2.2. Guidelines for Appendix A – Mandatory Criteria – Part 1 of 2

- 1) The Bidder’s authorized representative must initial in the ‘Initials’ column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 1 of 2.
- 2) The Bidder must respond with a ‘Yes’ or ‘No’ in the ‘Compliant (Y/N)?’ column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 1 of 2.
- 3) The following line item example is provided to demonstrate how to populate Appendix A – Mandatory Criteria – Part 1 of 2.

Item No.	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M1	All requirements stipulated in Annex A (Statement of Work) will be met.	Annex A (SOW) Annex B (TSOR)	The Bidder must include a Certificate of Compliance (Annex X of the Bid Solicitation) signed by an authorized representative.	Yes	JD	<i>Page 5 of the Bid</i>

2.3. Guidelines for Appendix A – Mandatory Criteria – Part 2 of 2

- 1) Various methods of compliance are listed in Appendix A – Mandatory Criteria –Part 2 of 2. The Bidder must carefully read the requested method(s) of compliance, as each method of compliance may differ between the mandatory criteria.
- 2) For a given criterion, the Bidder must provide ALL information requested to sufficiently demonstrate compliance, and cross-reference the appropriate location(s) within the Bid where such information can be found.
- 3) The Bidder’s authorized representative must initial in the ‘Initials’ column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 2 of 2.

- 4) The Bidder must respond with a 'Yes' or 'No' in the 'Compliant (Y/N)?' column for each mandatory requirement found in Appendix A – Mandatory Criteria – Part 2 of 2..
- 5) Failure to provide the requested information as per the defined method(s) of compliance and initial any given criterion will render that criterion Non-Compliant.
- 6) The following fictitious line item example is provided to demonstrate how to populate Appendix A – Mandatory Criteria – Part 2 of 2.

Item No.	Intent of Requirement	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M2	Show that the proposed lantern will comply with Annex A	The proposed lantern must satisfy the defined design and construction requirements.	Annex B (TSOR)	The Bidder must include technical data that demonstrates compliance with the requirements detailed in Annex A.	Yes	JD	<i>Section 4 – page 88 of the Bid</i>

Appendix A Mandatory Criteria

1. Mandatory Criteria – Part 1 of 2

Item No.	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M1	All requirements stipulated in Annex A (SOW - Statement of Work) and Annex C (TSOR - Technical Statement of Requirements) will be met.	Annex A (SOW) Annex C (TSOR)	The Bidder must include a Certificate of Compliance (Annex 2 to Part 4 of the Bid Solicitation) signed by an authorized representative.			

2. Mandatory Criteria – Part 2 of 2

Item No.	Intent of Requirement	Mandatory Requirement	Contract Reference	Method of Compliance	Compliant (Yes/No)	Initials	Bid Cross-Reference
M2	Show that the proposed lantern will comply with Annex A	The Bidder must provide technical documentation for the proposed omnidirectional beacon to demonstrate the mandatory mounting provisions requirement. TSOR ID: TR.5	Annex C (TSOR)	The Bid must include technical data to demonstrate compliance. Technical data may include brochures, Data Sheets or OEM manuals.			

			<ul style="list-style-type: none"> The bottom of the omnidirectional beacon base must be parallel to the light's focal plane. Any part of the omnidirectional beacon that overhangs the mounting holes shall be no less than 72.5mm above the mounting foot. Refer to ANNEX C Figure 1 in Appendix A. The mounting baseplate for the omnidirectional beacon must be in accordance with the 200 mm bolt circle in ANNEX C Figure 2 in Appendix A 					
M3	Show that the proposed lantern will comply with Annex A	<p>The Bidder must provide technical documentation for the proposed omnidirectional beacon to demonstrate the mandatory nominal range requirement.</p> <p>TSOR ID: TR.7</p> <ul style="list-style-type: none"> The omnidirectional beacon must have nominal nighttime range as identified in ANNEX C Table 3. The omnidirectional beacon must have an optional step-down function to allow for reduced intensity during nighttime operations. 	Annex C (TSOR)	<p>The Bid must include technical data to demonstrate compliance.</p> <p>Technical data may include brochures, Data Sheets, OEM manuals or Engineering Documentation.</p>				
M4	Show that the proposed lantern will comply with Annex A	The Bidder must provide technical documentation for the proposed omnidirectional beacon to demonstrate the mandatory vertical divergence requirement	Annex C (TSOR)	The Bid must include test data with the vertical divergence determined using the 50% point of rated intensity.				

		<p>TSOR ID: TR.8</p> <ul style="list-style-type: none"> Category 1 and 2: The omnidirectional beacon must have a vertical divergence of no less than 1.25° above the horizontal and 1.25° below the horizontal. Category 3 and 4: The omnidirectional beacon must have a vertical divergence of no less than 1° above the horizontal and 1° below the horizontal. The vertical divergence must be determined using the 50% point of rated intensity. 					
M5	<p>Show that the proposed lantern will comply with Annex A</p>	<p>The Bidder must provide technical documentation for the proposed omnidirectional beacon to demonstrate the mandatory technical requirements listed below:</p> <p>TSOR ID: TR.10</p> <p>The light signal provided by green, red, white, and yellow beacons must fall within the chromaticity regions of IALA E-200</p> <p>TSOR ID: TR.19</p> <p>The omnidirectional beacon must not be susceptible to interference from radiating devices normally found in the marine environment when tested in accordance with IEC 60945.</p>	Annex C (TSOR)	<p>The Bid must include test data as dictated in the performance specification, test date from an independent laboratory via an Industry Standard Test to validate that this requirement has been met.</p>			

Annex J – Basis of Payment

Instructions to Offerors:

There are four categories of Beacons and Lanterns. Offerors may submit for individual or all categories.

- *Category A lists configurations of Rotating Beacons*
- *Category B lists configurations of Arctic Rotating Beacons*
- *Category C lists configurations of Omnidirectional Beacons*
- *Category D lists configurations of Self-Contained LED Lanterns*

The Offeror must provide firm unit prices for each configuration within each category they are submitting an offer for;

The identification of all necessary equipment, software, peripherals, cabling and components required to meet the requirements of the standing offer and the associated costs of these items is the sole responsibility of the Offeror.

Estimated Annual Quantity values will not be used for evaluation purposes. Evaluation will be conducted in accordance with Request for Standing Offer Section 4.1.3 Financial Evaluation.

The Offeror must complete the fill-ins and tables of Annex J as follows:

- All prices must be in Canadian currency;*
- All prices must include customs duties;*
- All prices must not include Applicable Taxes;*
- The Offeror is requested to insert "\$0.00" for any cost of the cost elements for which it does not intend to charge - If any cost element is left blank, Canada will insert "\$0.00" for that element; and*

Note: These italicized Instructions to Offerors will not be included in any resulting offer.

CATEGORY A - ROTATING BEACONS

Table 1:

Rotating Beacons Configurations				
Configuration	Vertical Divergence	Nominal Range	Temperature Exposure	Estimated Annual Qty (EA)
Configuration 1	≥ 0.75°	15-20nm	-30°C to +40°C	50
Configuration 2	2.5°	15-20nm	-30°C to +40°C	
Configuration 3	≥ 0.75°	20-25nm	-30°C to +40°C	46
Configuration 4	2.5°	20-25nm	-30°C to +40°C	
Configuration 5	≥ 0.75°	>25nm	-30°C to +40°C	22
Configuration 6	2.5°	>25nm	-30°C to +40°C	

Estimated Annual Qty values are estimates only and do not reflect any guarantee of future order.

Table 2:

Item No.	Short Item Description	Year 1 Firm Unit Price (CAD) W	Year 2 Firm Unit Price (CAD) X	Option Year 1 Firm Unit Price (CAD) Y	Extended Price (CAD) (W+X+Y = Z) Z
1A	Rotating Beacon Configuration 1 With delivery to St. John's, NL				
2A	Rotating Beacon Configuration 1 With delivery to Dartmouth, NS				
3A	Rotating Beacon Configuration 1 With delivery to Charlottetown, PEI				
4A	Rotating Beacon Configuration 1 With delivery to Saint John, NB				
5A	Rotating Beacon Configuration 1 With delivery to Quebec City, QC				
6A	Rotating Beacon Configuration 1 With delivery to Sorel, QC				
7A	Rotating Beacon Configuration 1 With delivery to Parry Sound, ON				
8A	Rotating Beacon Configuration 1 With delivery to Prescott, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

9A	Rotating Beacon Configuration 1 With delivery to Hay River, NT				
10A	Rotating Beacon Configuration 1 With delivery to Victoria, BC				
11A	Rotating Beacon Configuration 1 With delivery to Prince Rupert, BC				
12A	Rotating Beacon Configuration 1 With delivery to Selkirk, MB				
13A	Rotating Beacon Configuration 2 With delivery to St. John's, NL				
14A	Rotating Beacon Configuration 2 With delivery to Dartmouth, NS				
15A	Rotating Beacon Configuration 2 With delivery to Charlottetown, PEI				
16A	Rotating Beacon Configuration 2 With delivery to Saint John, NB				
17A	Rotating Beacon Configuration 2 With delivery to Quebec City, QC				
18A	Rotating Beacon Configuration 2 With delivery to Sorel, QC				
19A	Rotating Beacon Configuration 2 With delivery to Parry Sound, ON				
20A	Rotating Beacon Configuration 2 With delivery to Prescott, ON				
21A	Rotating Beacon Configuration 2 With delivery to Hay River, NT				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

22A	Rotating Beacon Configuration 2 With delivery to Victoria, BC				
23A	Rotating Beacon Configuration 2 With delivery to Prince Rupert, BC				
24A	Rotating Beacon Configuration 2 With delivery to Selkirk, MB				
25A	Rotating Beacon Configuration 3 With delivery to St. John's, NL				
26A	Rotating Beacon Configuration 3 With delivery to Dartmouth, NS				
27A	Rotating Beacon Configuration 3 With delivery to Charlottetown, PEI				
28A	Rotating Beacon Configuration 3 With delivery to Saint John, NB				
29A	Rotating Beacon Configuration 3 With delivery to Quebec City, QC				
30A	Rotating Beacon Configuration 3 With delivery to Sorel, QC				
31A	Rotating Beacon Configuration 3 With delivery to Parry Sound, ON				
32A	Rotating Beacon Configuration 3 With delivery to Prescott, ON				
33A	Rotating Beacon Configuration 3 With delivery to Hay River, NT				
34A	Rotating Beacon Configuration 3 With delivery to Victoria, BC				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

35A	Rotating Beacon Configuration 3 With delivery to Prince Rupert, BC				
36A	Rotating Beacon Configuration 3 With delivery to Selkirk, MB				
37A	Rotating Beacon Configuration 4 With delivery to St. John's, NL				
38A	Rotating Beacon Configuration 4 With delivery to Dartmouth, NS				
39A	Rotating Beacon Configuration 4 With delivery to Charlottetown, PEI				
40A	Rotating Beacon Configuration 4 With delivery to Saint John, NB				
41A	Rotating Beacon Configuration 4 With delivery to Quebec City, QC				
42A	Rotating Beacon Configuration 4 With delivery to Sorel, QC				
43A	Rotating Beacon Configuration 4 With delivery to Parry Sound, ON				
44A	Rotating Beacon Configuration 4 With delivery to Prescott, ON				
45A	Rotating Beacon Configuration 4 With delivery to Hay River, NT				
46A	Rotating Beacon Configuration 4 With delivery to Victoria, BC				
47A	Rotating Beacon Configuration 4 With delivery to Prince Rupert, BC				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

48A	Rotating Beacon Configuration 4 With delivery to Selkirk, MB				
49A	Rotating Beacon Configuration 5 With delivery to St. John's, NL				
50A	Rotating Beacon Configuration 5 With delivery to Dartmouth, NS				
51A	Rotating Beacon Configuration 5 With delivery to Charlottetown, PEI				
52A	Rotating Beacon Configuration 5 With delivery to Saint John, NB				
53A	Rotating Beacon Configuration 5 With delivery to Quebec City, QC				
54A	Rotating Beacon Configuration 5 With delivery to Sorel, QC				
55A	Rotating Beacon Configuration 5 With delivery to Parry Sound, ON				
56A	Rotating Beacon Configuration 5 With delivery to Prescott, ON				
57A	Rotating Beacon Configuration 5 With delivery to Hay River, NT				
58A	Rotating Beacon Configuration 5 With delivery to Victoria, BC				
59A	Rotating Beacon Configuration 5 With delivery to Prince Rupert, BC				
60A	Rotating Beacon Configuration 5 With delivery to Selkirk, MB				

Solicitation No. - N° de l'invitation
 F7047-231214
 Client Ref. No. - N° de réf. du client
 F7047-231214-012ERD

Amd. No. - N° de la modif.
 File No. - N° du dossier
 F7047-231214-012ERD

Buyer ID - Id de l'acheteur
 012ERD
 CCC No./N° CCC - FMS No./N° VME

61A	Rotating Beacon Configuration 6 With delivery to St. John's, NL				
62A	Rotating Beacon Configuration 6 With delivery to Dartmouth, NS				
63A	Rotating Beacon Configuration 6 With delivery to Charlottetown, PEI				
64A	Rotating Beacon Configuration 6 With delivery to Saint John, NB				
65A	Rotating Beacon Configuration 6 With delivery to Quebec City, QC				
66A	Rotating Beacon Configuration 6 With delivery to Sorel, QC				
67A	Rotating Beacon Configuration 6 With delivery to Parry Sound, ON				
68A	Rotating Beacon Configuration 6 With delivery to Prescott, ON				
69A	Rotating Beacon Configuration 6 With delivery to Hay River, NT				
70A	Rotating Beacon Configuration 6 With delivery to Victoria, BC				
71A	Rotating Beacon Configuration 6 With delivery to Prince Rupert, BC				
72A	Rotating Beacon Configuration 6 With delivery to Selkirk, MB				
73A	Category 1 Total Extended Price = Sum of Z1A – Z72A inclusive				

CATEGORY B – ARCTIC ROTATING BEACONS

Table 3:

Arctic Rotating Beacons Configurations				
Configuration	Vertical Divergence	Nominal Range	Temperature Exposure	Estimated Annual Qty (EA)
Configuration 1	≥ 0.75°	15-20nm	-35°C to +40°C	1
Configuration 2	2.5°	15-20nm	-35°C to +40°C	
Configuration 3	≥ 0.75°	20-25nm	-35°C to +40°C	1
Configuration 4	2.5°	20-25nm	-35°C to +40°C	
Configuration 5	≥ 0.75°	>25nm	-35°C to +40°C	1
Configuration 6	2.5°	>25nm	-35°C to +40°C	

Estimated Annual Qty values are estimates only and do not reflect any guarantee of future order.

Table 4:

Item No.	Short Item Description	Year 1 Firm Unit Price (CAD) W	Year 2 Firm Unit Price (CAD) X	Option Year 1 Firm Unit Price (CAD) Y	Extended Price (CAD) (W+X+Y = Z) Z
1B	Arctic Rotating Beacon Configuration 1 With delivery to St. John's, NL				
2B	Arctic Rotating Beacon Configuration 1 With delivery to Dartmouth, NS				
3B	Arctic Rotating Beacon Configuration 1 With delivery to Charlottetown, PEI				
4B	Arctic Rotating Beacon Configuration 1 With delivery to Saint John, NB				
5B	Arctic Rotating Beacon Configuration 1 With delivery to Quebec City, QC				
6B	Arctic Rotating Beacon Configuration 1 With delivery to Sorel, QC				
7B	Arctic Rotating Beacon Configuration 1 With delivery to Parry Sound, ON				
8B	Arctic Rotating Beacon Configuration 1 With delivery to Prescott, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

9B	Arctic Rotating Beacon Configuration 1 With delivery to Hay River, NT				
10B	Arctic Rotating Beacon Configuration 1 With delivery to Victoria, BC				
11B	Arctic Rotating Beacon Configuration 1 With delivery to Prince Rupert, BC				
12B	Arctic Rotating Beacon Configuration 1 With delivery to Selkirk, MB				
13B	Arctic Rotating Beacon Configuration 2 With delivery to St. John's, NL				
14B	Arctic Rotating Beacon Configuration 2 With delivery to Dartmouth, NS				
15B	Arctic Rotating Beacon Configuration 2 With delivery to Charlottetown, PEI				
16B	Arctic Rotating Beacon Configuration 2 With delivery to Saint John, NB				
17B	Arctic Rotating Beacon Configuration 2 With delivery to Quebec City, QC				
18B	Arctic Rotating Beacon Configuration 2 With delivery to Sorel, QC				
19B	Arctic Rotating Beacon Configuration 2 With delivery to Parry Sound, ON				
20B	Arctic Rotating Beacon Configuration 2 With delivery to Prescott, ON				
21B	Arctic Rotating Beacon Configuration 2 With delivery to Hay River, NT				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

22B	Arctic Rotating Beacon Configuration 2 With delivery to Victoria, BC				
23B	Arctic Rotating Beacon Configuration 2 With delivery to Prince Rupert, BC				
24B	Arctic Rotating Beacon Configuration 2 With delivery to Selkirk, MB				
25B	Arctic Rotating Beacon Configuration 3 With delivery to St. John's, NL				
26B	Arctic Rotating Beacon Configuration 3 With delivery to Dartmouth, NS				
27B	Arctic Rotating Beacon Configuration 3 With delivery to Charlottetown, PEI				
28B	Arctic Rotating Beacon Configuration 3 With delivery to Saint John, NB				
29B	Arctic Rotating Beacon Configuration 3 With delivery to Quebec City, QC				
30B	Arctic Rotating Beacon Configuration 3 With delivery to Sorel, QC				
31B	Arctic Rotating Beacon Configuration 3 With delivery to Parry Sound, ON				
32B	Arctic Rotating Beacon Configuration 3 With delivery to Prescott, ON				
33B	Arctic Rotating Beacon Configuration 3 With delivery to Hay River, NT				
34B	Arctic Rotating Beacon Configuration 3 With delivery to Victoria, BC				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

35B	Arctic Rotating Beacon Configuration 3 With delivery to Prince Rupert, BC				
36B	Arctic Rotating Beacon Configuration 3 With delivery to Selkirk, MB				
37B	Arctic Rotating Beacon Configuration 4 With delivery to St. John's, NL				
38B	Arctic Rotating Beacon Configuration 4 With delivery to Dartmouth, NS				
39B	Arctic Rotating Beacon Configuration 4 With delivery to Charlottetown, PEI				
40B	Arctic Rotating Beacon Configuration 4 With delivery to Saint John, NB				
41B	Arctic Rotating Beacon Configuration 4 With delivery to Quebec City, QC				
42B	Arctic Rotating Beacon Configuration 4 With delivery to Sorel, QC				
43B	Arctic Rotating Beacon Configuration 4 With delivery to Parry Sound, ON				
44B	Arctic Rotating Beacon Configuration 4 With delivery to Prescott, ON				
45B	Arctic Rotating Beacon Configuration 4 With delivery to Hay River, NT				
46B	Arctic Rotating Beacon Configuration 4 With delivery to Victoria, BC				
47B	Arctic Rotating Beacon Configuration 4 With delivery to Prince Rupert, BC				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

48B	Arctic Rotating Beacon Configuration 4 With delivery to Selkirk, MB				
49B	Arctic Rotating Beacon Configuration 5 With delivery to St. John's, NL				
50B	Arctic Rotating Beacon Configuration 5 With delivery to Dartmouth, NS				
51B	Arctic Rotating Beacon Configuration 5 With delivery to Charlottetown, PEI				
52B	Arctic Rotating Beacon Configuration 5 With delivery to Saint John, NB				
53B	Arctic Rotating Beacon Configuration 5 With delivery to Quebec City, QC				
54B	Arctic Rotating Beacon Configuration 5 With delivery to Sorel, QC				
55B	Arctic Rotating Beacon Configuration 5 With delivery to Parry Sound, ON				
56B	Arctic Rotating Beacon Configuration 5 With delivery to Prescott, ON				
57B	Arctic Rotating Beacon Configuration 5 With delivery to Hay River, NT				
58B	Arctic Rotating Beacon Configuration 5 With delivery to Victoria, BC				
59B	Arctic Rotating Beacon Configuration 5 With delivery to Prince Rupert, BC				
60B	Arctic Rotating Beacon Configuration 5 With delivery to Selkirk, MB				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

61B	Arctic Rotating Beacon Configuration 6 With delivery to St. John's, NL				
62B	Arctic Rotating Beacon Configuration 6 With delivery to Dartmouth, NS				
63B	Arctic Rotating Beacon Configuration 6 With delivery to Charlottetown, PEI				
64B	Arctic Rotating Beacon Configuration 6 With delivery to Saint John, NB				
65B	Arctic Rotating Beacon Configuration 6 With delivery to Quebec City, QC				
66B	Arctic Rotating Beacon Configuration 6 With delivery to Sorel, QC				
67B	Arctic Rotating Beacon Configuration 6 With delivery to Parry Sound, ON				
68B	Arctic Rotating Beacon Configuration 6 With delivery to Prescott, ON				
69B	Arctic Rotating Beacon Configuration 6 With delivery to Hay River, NT				
70B	Arctic Rotating Beacon Configuration 6 With delivery to Victoria, BC				
71B	Arctic Rotating Beacon Configuration 6 With delivery to Prince Rupert, BC				
72B	Arctic Rotating Beacon Configuration 6 With delivery to Selkirk, MB				
73B	Category 2 Total Extended Price Sum of Z1B – Z72B inclusive				

CATEGORY C - OMNIDIRECTIONAL BEACONS

Table 5:

Omnidirectional Beacon Configurations		
Configuration	Nominal range (Nautical Miles)	Estimated Annual Qty (EA)
Configuration 1	<7nm	122
Configuration 2	7-12nm	132
Configuration 3	12-17nm	98
Configuration 4	>17nm	16

Estimated Annual Qty values are estimates only and do not reflect any guarantee of future order.

Table 6:

Item No.	Short Item Description	Year 1 Firm Unit Price (CAD) W	Year 2 Firm Unit Price (CAD) X	Option Year 1 Firm Unit Price (CAD) Y	Extended Price (CAD) (W+X+Y = Z) Z
1C	Omnidirectional Beacon Configuration 1 With delivery to St. John's, NL				
2C	Omnidirectional Beacon Configuration 1 With delivery to Dartmouth, NS				
3C	Omnidirectional Beacon Configuration 1 With delivery to Charlottetown, PEI				
4C	Omnidirectional Beacon Configuration 1 With delivery to Saint John, NB				
5C	Omnidirectional Beacon Configuration 1 With delivery to Quebec City, QC				
6C	Omnidirectional Beacon Configuration 1 With delivery to Sorel, QC				
7C	Omnidirectional Beacon Configuration 1 With delivery to Parry Sound, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

8C	Omnidirectional Beacon Configuration 1 With delivery to Prescott, ON				
9C	Omnidirectional Beacon Configuration 1 With delivery to Hay River, NT				
10C	Omnidirectional Beacon Configuration 1 With delivery to Victoria, BC				
11C	Omnidirectional Beacon Configuration 1 With delivery to Prince Rupert, BC				
12C	Omnidirectional Beacon Configuration 1 With delivery to Selkirk, MB				
13C	Omnidirectional Beacon Configuration 2 With delivery to St. John's, NL				
14C	Omnidirectional Beacon Configuration 2 With delivery to Dartmouth, NS				
15C	Omnidirectional Beacon Configuration 2 With delivery to Charlottetown, PEI				
16C	Omnidirectional Beacon Configuration 2 With delivery to Saint John, NB				
17C	Omnidirectional Beacon Configuration 2 With delivery to Quebec City, QC				
18C	Omnidirectional Beacon Configuration 2 With delivery to Sorel, QC				
19C	Omnidirectional Beacon Configuration 2 With delivery to Parry Sound, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

20C	Omnidirectional Beacon Configuration 2 With delivery to Prescott, ON				
21C	Omnidirectional Beacon Configuration 2 With delivery to Hay River, NT				
22C	Omnidirectional Beacon Configuration 2 With delivery to Victoria, BC				
23C	Omnidirectional Beacon Configuration 2 With delivery to Prince Rupert, BC				
24C	Omnidirectional Beacon Configuration 2 With delivery to Selkirk, MB				
25C	Omnidirectional Beacon Configuration 3 With delivery to St. John's, NL				
26C	Omnidirectional Beacon Configuration 3 With delivery to Dartmouth, NS				
27C	Omnidirectional Beacon Configuration 3 With delivery to Charlottetown, PEI				
28C	Omnidirectional Beacon Configuration 3 With delivery to Saint John, NB				
29C	Omnidirectional Beacon Configuration 3 With delivery to Quebec City, QC				
30C	Omnidirectional Beacon Configuration 3 With delivery to Sorel, QC				
31C	Omnidirectional Beacon Configuration 3 With delivery to Parry Sound, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

32C	Omnidirectional Beacon Configuration 3 With delivery to Prescott, ON				
33C	Omnidirectional Beacon Configuration 3 With delivery to Hay River, NT				
34C	Omnidirectional Beacon Configuration 3 With delivery to Victoria, BC				
35C	Omnidirectional Beacon Configuration 3 With delivery to Prince Rupert, BC				
36C	Omnidirectional Beacon Configuration 3 With delivery to Selkirk, MB				
37C	Omnidirectional Beacon Configuration 4 With delivery to St. John's, NL				
38C	Omnidirectional Beacon Configuration 4 With delivery to Dartmouth, NS				
39C	Omnidirectional Beacon Configuration 4 With delivery to Charlottetown, PEI				
40C	Omnidirectional Beacon Configuration 4 With delivery to Saint John, NB				
41C	Omnidirectional Beacon Configuration 4 With delivery to Quebec City, QC				
42C	Omnidirectional Beacon Configuration 4 With delivery to Sorel, QC				
43C	Omnidirectional Beacon Configuration 4 With delivery to Parry Sound, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

44C	Omnidirectional Beacon Configuration 4 With delivery to Prescott, ON				
45C	Omnidirectional Beacon Configuration 4 With delivery to Hay River, NT				
46C	Omnidirectional Beacon Configuration 4 With delivery to Victoria, BC				
47C	Omnidirectional Beacon Configuration 4 With delivery to Prince Rupert, BC				
48C	Omnidirectional Beacon Configuration 4 With delivery to Selkirk, MB				
49C	Category 3 Total Extended Price Sum of Z1C – Z48C inclusive				

CATEGORY D - Self-Contained LED Lanterns (SCOLLs)

Table 7:

Self-Contained LED Lanterns (SCOLLs) Configurations									
Config.	Nominal Range (nm)	Minimum Effective Intensity (cd)	Minimum Vertical Divergence	Maximum Diameter (mm)	Maximum Height (mm) – excluding bird deterrents	Maximum Weight (kg) – complete assembled unit	Minimum IP Rating	Autonomy	Estimated Annual Quantity
1	1.5	2.5	3.5° (above), 3.5° (below)	250	300	3	IP 68	TYPE A	135
2	2	5	3.5° (above), 3.5° (below)	250	300	3	IP 68	TYPE A	580
3	3	15	3.5° (above), 3.5° (below)	400	450	6	IP 68	TYPE A	580
4	4	36	3.5° (above), 3.5° (below)	700	590	11	IP 68	TYPE A	377
5	5	75	2.5° (above), 2.5° (below)	700	590	23	IP 67	TYPE A	504
6	6	150	2.5° (above), 2.5° (below)	700	660	23	IP 67	TYPE A	86
7	1.5	2.5	3.5° (above), 3.5° (below)	250	300	3	IP 68	TYPE B	7
8	2	5	3.5° (above), 3.5° (below)	250	300	3	IP 68	TYPE B	8
9	3	15	3.5° (above), 3.5° (below)	400	450	6	IP 68	TYPE B	8
10	4	36	3.5° (above), 3.5° (below)	700	590	11	IP 68	TYPE B	8
11	5	75	2.5° (above), 2.5° (below)	700	590	23	IP 67	TYPE B	6
12	6	150	2.5° (above), 2.5° (below)	700	660	23	IP 67	TYPE B	8

Estimated Annual Qty values are estimates only and do not reflect any guarantee of future order.

Table 8:

Solicitation No. - N° de l'invitation
 F7047-231214
 Client Ref. No. - N° de réf. du client
 F7047-231214-012ERD

Amd. No. - N° de la modif.
 File No. - N° du dossier
 F7047-231214-012ERD

Buyer ID - Id de l'acheteur
 012ERD
 CCC No./N° CCC - FMS No./N° VME

Item No.	Short Item Description	Year 1 Firm Unit Price (CAD) W	Year 2 Firm Unit Price (CAD) X	Option Year 1 Firm Unit Price (CAD) Y	Extended Price (CAD) (W+X+Y = Z) Z
1D	SCOLL Configuration 1 With delivery to St. John's, NL				
2D	SCOLL Configuration 1 With delivery to Dartmouth, NS				
3D	SCOLL Configuration 1 With delivery to Charlottetown, PEI				
4D	SCOLL Configuration 1 With delivery to Saint John, NB				
5D	SCOLL Configuration 1 With delivery to Quebec City, QC				
6D	SCOLL Configuration 1 With delivery to Sorel, QC				
7D	SCOLL Configuration 1 With delivery to Parry Sound, ON				
8D	SCOLL Configuration 1 With delivery to Prescott, ON				
9D	SCOLL Configuration 1 With delivery to Hay River, NT				
10D	SCOLL Configuration 1 With delivery to Victoria, BC				
11D	SCOLL Configuration 1 With delivery to Prince Rupert, BC				
12D	SCOLL Configuration 1 With delivery to Selkirk, MB				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

13D	SCOLL Configuration 2 With delivery to St. John's, NL				
14D	SCOLL Configuration 2 With delivery to Dartmouth, NS				
15D	SCOLL Configuration 2 With delivery to Charlottetown, PEI				
16D	SCOLL Configuration 2 With delivery to Saint John, NB				
17D	SCOLL Configuration 2 With delivery to Quebec City, QC				
18D	SCOLL Configuration 2 With delivery to Sorel, QC				
19D	SCOLL Configuration 2 With delivery to Parry Sound, ON				
20D	SCOLL Configuration 2 With delivery to Prescott, ON				
21D	SCOLL Configuration 2 With delivery to Hay River, NT				
22D	SCOLL Configuration 2 With delivery to Victoria, BC				
23D	SCOLL Configuration 2 With delivery to Prince Rupert, BC				
24D	SCOLL Configuration 2 With delivery to Selkirk, MB				
25D	SCOLL Configuration 3 With delivery to St. John's, NL				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

26D	SCOLL Configuration 3 With delivery to Dartmouth, NS				
27D	SCOLL Configuration 3 With delivery to Charlottetown, PEI				
28D	SCOLL Configuration 3 With delivery to Saint John, NB				
29D	SCOLL Configuration 3 With delivery to Quebec City, QC				
30D	SCOLL Configuration 3 With delivery to Sorel, QC				
31D	SCOLL Configuration 3 With delivery to Parry Sound, ON				
32D	SCOLL Configuration 3 With delivery to Prescott, ON				
33D	SCOLL Configuration 3 With delivery to Hay River, NT				
34D	SCOLL Configuration 3 With delivery to Victoria, BC				
35D	SCOLL Configuration 3 With delivery to Prince Rupert, BC				
36D	SCOLL Configuration 3 With delivery to Selkirk, MB				
37D	SCOLL Configuration 4 With delivery to St. John's, NL				
38D	SCOLL Configuration 4 With delivery to Dartmouth, NS				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

39D	SCOLL Configuration 4 With delivery to Charlottetown, PEI				
40D	SCOLL Configuration 4 With delivery to Saint John, NB				
41D	SCOLL Configuration 4 With delivery to Quebec City, QC				
42D	SCOLL Configuration 4 With delivery to Sorel, QC				
43D	SCOLL Configuration 4 With delivery to Parry Sound, ON				
44D	SCOLL Configuration 4 With delivery to Prescott, ON				
45D	SCOLL Configuration 4 With delivery to Hay River, NT				
46D	SCOLL Configuration 4 With delivery to Victoria, BC				
47D	SCOLL Configuration 4 With delivery to Prince Rupert, BC				
48D	SCOLL Configuration 4 With delivery to Selkirk, MB				
49D	SCOLL Configuration 5 With delivery to St. John's, NL				
50D	SCOLL Configuration 5 With delivery to Dartmouth, NS				
51D	SCOLL Configuration 5 With delivery to Charlottetown, PEI				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

52D	SCOLL Configuration 5 With delivery to Saint John, NB				
53D	SCOLL Configuration 5 With delivery to Quebec City, QC				
54D	SCOLL Configuration 5 With delivery to Sorel, QC				
55D	SCOLL Configuration 5 With delivery to Parry Sound, ON				
56D	SCOLL Configuration 5 With delivery to Prescott, ON				
57D	SCOLL Configuration 5 With delivery to Hay River, NT				
58D	SCOLL Configuration 5 With delivery to Victoria, BC				
59D	SCOLL Configuration 5 With delivery to Prince Rupert, BC				
60D	SCOLL Configuration 5 With delivery to Selkirk, MB				
61D	SCOLL Configuration 6 With delivery to St. John's, NL				
62D	SCOLL Configuration 6 With delivery to Dartmouth, NS				
63D	SCOLL Configuration 6 With delivery to Charlottetown, PEI				
64D	SCOLL Configuration 6 With delivery to Saint John, NB				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

65D	SCOLL Configuration 6 With delivery to Quebec City, QC				
66D	SCOLL Configuration 6 With delivery to Sorel, QC				
67D	SCOLL Configuration 6 With delivery to Parry Sound, ON				
68D	SCOLL Configuration 6 With delivery to Prescott, ON				
69D	SCOLL Configuration 6 With delivery to Hay River, NT				
70D	SCOLL Configuration 6 With delivery to Victoria, BC				
71D	SCOLL Configuration 6 With delivery to Prince Rupert, BC				
72D	SCOLL Configuration 6 With delivery to Selkirk, MB				
73D	SCOLL Configuration 7 With delivery to St. John's, NL				
74D	SCOLL Configuration 7 With delivery to Dartmouth, NS				
75D	SCOLL Configuration 7 With delivery to Charlottetown, PEI				
76D	SCOLL Configuration 7 With delivery to Saint John, NB				
77D	SCOLL Configuration 7 With delivery to Quebec City, QC				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

78D	SCOLL Configuration 7 With delivery to Sorel, QC				
79D	SCOLL Configuration 7 With delivery to Parry Sound, ON				
80D	SCOLL Configuration 7 With delivery to Prescott, ON				
81D	SCOLL Configuration 7 With delivery to Hay River, NT				
82D	SCOLL Configuration 7 With delivery to Victoria, BC				
83D	SCOLL Configuration 7 With delivery to Prince Rupert, BC				
84D	SCOLL Configuration 7 With delivery to Selkirk, MB				
85D	SCOLL Configuration 8 With delivery to St. John's, NL				
86D	SCOLL Configuration 8 With delivery to Dartmouth, NS				
87D	SCOLL Configuration 8 With delivery to Charlottetown, PEI				
88D	SCOLL Configuration 8 With delivery to Saint John, NB				
89D	SCOLL Configuration 8 With delivery to Quebec City, QC				
90D	SCOLL Configuration 8 With delivery to Sorel, QC				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

91D	SCOLL Configuration 8 With delivery to Parry Sound, ON				
92D	SCOLL Configuration 8 With delivery to Prescott, ON				
93D	SCOLL Configuration 8 With delivery to Hay River, NT				
94D	SCOLL Configuration 8 With delivery to Victoria, BC				
95D	SCOLL Configuration 8 With delivery to Prince Rupert, BC				
96D	SCOLL Configuration 8 With delivery to Selkirk, MB				
97D	SCOLL Configuration 9 With delivery to St. John's, NL				
98D	SCOLL Configuration 9 With delivery to Dartmouth, NS				
99D	SCOLL Configuration 9 With delivery to Charlottetown, PEI				
100D	SCOLL Configuration 9 With delivery to Saint John, NB				
101D	SCOLL Configuration 9 With delivery to Quebec City, QC				
102D	SCOLL Configuration 9 With delivery to Sorel, QC				
103D	SCOLL Configuration 9 With delivery to Parry Sound, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

104D	SCOLL Configuration 9 With delivery to Prescott, ON				
105D	SCOLL Configuration 9 With delivery to Hay River, NT				
106D	SCOLL Configuration 9 With delivery to Victoria, BC				
107D	SCOLL Configuration 9 With delivery to Prince Rupert, BC				
108D	SCOLL Configuration 9 With delivery to Selkirk, MB				
109D	SCOLL Configuration 10 With delivery to St. John's, NL				
110D	SCOLL Configuration 10 With delivery to Dartmouth, NS				
111D	SCOLL Configuration 10 With delivery to Charlottetown, PEI				
112D	SCOLL Configuration 10 With delivery to Saint John, NB				
113D	SCOLL Configuration 10 With delivery to Quebec City, QC				
114D	SCOLL Configuration 10 With delivery to Sorel, QC				
115D	SCOLL Configuration 10 With delivery to Parry Sound, ON				
116D	SCOLL Configuration 10 With delivery to Prescott, ON				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

117D	SCOLL Configuration 10 With delivery to Hay River, NT				
118D	SCOLL Configuration 10 With delivery to Victoria, BC				
119D	SCOLL Configuration 10 With delivery to Prince Rupert, BC				
120D	SCOLL Configuration 10 With delivery to Selkirk, MB				
121D	SCOLL Configuration 11 With delivery to St. John's, NL				
122D	SCOLL Configuration 11 With delivery to Dartmouth, NS				
123D	SCOLL Configuration 11 With delivery to Charlottetown, PEI				
124D	SCOLL Configuration 11 With delivery to Saint John, NB				
125D	SCOLL Configuration 11 With delivery to Quebec City, QC				
126D	SCOLL Configuration 11 With delivery to Sorel, QC				
126D	SCOLL Configuration 11 With delivery to Parry Sound, ON				
128D	SCOLL Configuration 11 With delivery to Prescott, ON				
129D	SCOLL Configuration 11 With delivery to Hay River, NT				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

130D	SCOLL Configuration 11 With delivery to Victoria, BC				
131D	SCOLL Configuration 11 With delivery to Prince Rupert, BC				
132D	SCOLL Configuration 11 With delivery to Selkirk, MB				
133D	SCOLL Configuration 12 With delivery to St. John's, NL				
134D	SCOLL Configuration 12 With delivery to Dartmouth, NS				
135D	SCOLL Configuration 12 With delivery to Charlottetown, PEI				
136D	SCOLL Configuration 12 With delivery to Saint John, NB				
137D	SCOLL Configuration 12 With delivery to Quebec City, QC				
138D	SCOLL Configuration 12 With delivery to Sorel, QC				
139D	SCOLL Configuration 12 With delivery to Parry Sound, ON				
140D	SCOLL Configuration 12 With delivery to Prescott, ON				
141D	SCOLL Configuration 12 With delivery to Hay River, NT				
142D	SCOLL Configuration 12 With delivery to Victoria, BC				

Solicitation No. - N° de l'invitation
F7047-231214
Client Ref. No. - N° de réf. du client
F7047-231214-012ERD

Amd. No. - N° de la modif.
File No. - N° du dossier
F7047-231214-012ERD

Buyer ID - Id de l'acheteur
012ERD
CCC No./N° CCC - FMS No./N° VME

143D	SCOLL Configuration 12 With delivery to Prince Rupert, BC				
144D	SCOLL Configuration 12 With delivery to Selkirk, MB				
145D	Category 4 Total Extended Price Sum of Z1D– Z144D inclusive				