ANNEX «A » -STATEMENT OF WORK

1.0 TITLE

Maintenance of buoys and their accessories

2.0 INTRODUCTION

The Canadian Coast Guard has buoys in the region of Lower North Shore, North Shore and Gaspésie, it must ensure a safe navigation.

3.0 OBJECTIVE

Maintain aids to navigation in good condition to extend their useful life and deliver service to users.

4.0 TASK , DELIVERABLE

Stages of work:

4.1 The contractor must provide the labor, materials and equipment required to handle and transport the buoys from the Gaspé transfer dock to the work site.

4.2 Collaborate in the loading/unloading scheduling of buoys and equipment.

4.3 Complete cleaning of all buoys.

4.4 Pressure test.

4.5 Produce a written report 21 days after the landing of the buoys.

4.6 Purge the buoys

4.7 Check the accessories.

4.8 Paint buoys according to the quote.

4.9 The buoys must be ready for launch on the dates given by the Canadian Coast Guard.

5.0 SPECIFICATIONS AND STANDARDS

All work must be done to the specifications of the manufacturer and the Canadian welding office.

6.0 WORK LANGUAGE

The works will be executed in French.

7.0 WORK LOCATION

All work will be performed at the suppliers business place.

8.0 TRAVEL EXPENSES

There are no travel requirements associated with this contract.

SPECIFICATIONS

BUOYS MAINTENANCE LOWER NORTH SHORE, NORTH SHORE AND GASPÉSIE

Revised August 2019

1.0 GENERAL

1.1 The Canadian Coast Guard seeks to award a contract for the tending and secure storage of summer and winter buoys (a total of up to 70) and their accessories. The buoys in question are located in the area from Lower North Shore, North Shore and Gaspésie.

1.2 The contractor shall agree with the Canadian Coast Guard representative on a dock (Gaspé) acceptable to both parties for buoy delivery/removal according to the dates established by the Canadian Coast Guard's buoy placement program.

2.0 SCHEDULE

2.1 The planned loading/unloading dates will be established by the Canadian Coast Guard's placement/removal program and communicated to the Contractor, and will remain subject to change.

2.2 The contractor will maintain the buoys and their accessories and ensure that the buoys will be operational for placement in the water. All buoys and accessories under this contract **will be deliverable** to the ports agreed on by the two parties, starting **April 1 of each year for summer buoys and October 1 of each year for winter spar buoys.**

2.3 The Canadian Coast Guard's acceptance of the contractor's work will take place at the contractor's place of business one (1) month before the placement program's start date.

2.4 If the contractor must redo its work on the buoys and accessories after the Canadian Coast Guard representative's acceptance inspection, the costs of the second inspection will be assumed by the contractor.

3.0 CANADIAN COAST GUARD RESPONSIBILITIES

3.1 Provide the contractor with a list of parts supplied and likely to be replaced on a buoy, including its accessories. **(See Appendix J)**.

3.2 Supply and deliver to the contractor all the parts to be replaced that were identified based on that list and the stipulated conditions **(See Appendix J)**.

3.3 Provide the contractor with other spare parts in addition to those set out in 3.1, subject to agreement with the Canadian Coast Guard representative, in order to prepare for any eventuality during the term of the contract.

3.4 Provide the contractor with the template for measuring wear on buoy chains and bridles.

3.5 Provide the contractor with any additional information necessary to understand the contract.

3.6 Provide the contractor with training on the equipment to be maintained. This training will be provided to the contractor **at the beginning of the contract and annually if the Contractor so requests**.

3.7 Provide the contractor with any hazard and/or safety advisories issued by the Canadian Coast Guard regarding the equipment being maintained.

3.8 When the Canadian Coast Guard unloads buoys (If applicable), the vessel will provide a cargo manifest to the contractor.

4.0 CONTRACTOR RESPONSIBILITIES

4.1 The contractor must provide appropriate facilities to meet the technical requirements in these specifications (warehouses, hangars and heated and ventilated, area workshops etc.).

4.2 The contractor must provide the tools and qualified personnel required to meet the technical and legal requirements in these specifications.

4.3 The contractor must provide the Canadian Coast Guard representative with its written work procedure for handling and storing summer and winter buoys. This procedure must meet all the Canadian Coast Guard's workplace health and safety requirements.

4.4 The contractor must take into account all hazard and/or safety advisories issued by the Canadian Coast Guard concerning the equipment in its possession. These advisories will be provided by the Canadian Coast Guard when applicable.

4.5 Within twenty-one (21) days after unloading the buoys, the contractor is required to have inspected the buoys and equipment and must be able to provide the Canadian Coast Guard with a written list of electrical, electronic or mechanical parts that need to be replaced (see 7.2).

4.6 The contractor must ensure that buoy tending sheets (provided by the Canadian Coast Guard) are kept up to date and submit a copy to the Canadian Coast Guard representative when the buoys are inspected after maintenance.

4.7 The Canadian Coast Guard reserves the right to visit work and storage sites without prior notice to check on the quality and progress of the work.

4.8 The contractor will make any adjustments deemed necessary by the Canadian Coast Guard, at its own expense, to meet the requirements in these specifications.

4.9 The contractor will be required to maintain and report on the inventory of spare parts made available to the Canadian Coast Guard when requested by the Canadian Coast Guard.

4.10 The contractor will ensure that its workplace complies with all requirements, acts and regulations concerning health and safety and protection of the environment. It must ensure that it holds any licences required for its operations.

4.11 At the end of the contract, the contractor must return to the Canadian Coast Guard the spare parts (inventory) that it has on hand.

5.0 SCOPE OF WORK

5.1 The contractor will provide the labour, materials and equipment required to handle the buoys and transport them from the chosen transhipment dock to its workplace. The buoys will be moved to the dock as they are placed/removed by the Canadian Coast Guard vessel. The contractor must also provide the labour, materials and equipment necessary to handle buoys and equipment and transport them from its workplace to the transhipment dock. The buoys and equipment must gradually be moved as they are loaded according to the manifest and in the order provided by the vessel.

5.2 The contractor will collaborate in the unloading/loading/scheduling of buoys and equipment. It will then remove them from the unloading/loading area to avoid hindering traffic and other activities on the dock.

5.3 The contractor's equipment must be able to safely maneuver one or more loads of up to 5,500 kg and allow for loading on a transport platform. Some buoys can reach 10 metres in length and also, 3 metres in diameter.

5.4 Transportation of buoys and equipment to the storage location must take place within 48 hours.

5.5 Transportation must comply with all provincial and municipal acts and regulations (weight, width, height).

6.0 CLEAN-UP

6.1 Before carrying out the inspection, the contractor will clean the buoys and equipment using brushes and/or water pressure to remove any build-up of marine growth, paying special attention to sensors and lanterns to avoid damage.

6.2 This step will facilitate the maintenance operations described in this estimate.

7.0 INSPECTION AND REPORTING

7.1 The contractor must inspect the buoys and equipment within twenty-one (21) days after they are unloaded to assess the work to be done.

7.2 The contractor will complete a written inspection report and submit it to the Canadian Coast Guard representative within five (5) days after inspection, for validation purposes. This report will identify the maintenance and work required for the buoys to meet the requirements in this contract and will also assess any materials and adjustments required that are not included in this contract. The contractor will also provide a schedule for completion of work at the same time.

7.3 The tending sheet for each buoy (**Appendix I**) must identify all the work performed on the buoys and equipment and be returned each year to the Canadian Coast Guard representative as soon as the work is completed.

8.0 MECHANICAL MAINTENANCE

8.1 Purging metal buoys is crucial before beginning maintenance, welding and other types of work, since it has been shown that the buoy's hull can contain combustible gases that could endanger the lives of workers. The contractor must carefully follow the instructions found in **Appendix A**.

8.2 The watertightness of metal buoys must be confirmed by checking for water inside the buoy's hull with a rod. If water is present, pump it out. Then apply air pressure at 5 lb/in². Maintain this pressure (check valve) for 30 minutes to detect any possible leaks. Use a solution of soap and water to locate any such leaks. Pay close attention to welding joints. Each buoy is built with the openings required to perform these tests. There is no work to be done inside the buoys except the purging described in 8.1. Repair any leaks detected in the buoys.

8.3 The watertightness of plastic buoys must be confirmed by checking for water inside the buoy's hull. If there water, it should be removed. If a major fault is found, the contractor have to change the buoy completely.

8.4 Buoy hoisting eyes (approximately 250) must be checked visually for cracks and strain (about 2% of total). A strike with a 4 lbs hammer must be applied to their sides to detect any abnormal vibrations or sounds. If needed, remove paint using a blowtorch to better see the metal. Since the paint may contain lead, an appropriate mask is required. Pay close attention to avoid overheating the metal. If repairs are necessary, contact the Canadian Coast Guard representative

8.5 For buoys with plastic lifting rings, the contractor will have to change the entire buoy if he notices the presence of anomalies.

8.6 The buoy's mooring rings (approximately 125) must be checked visually for cracks and deformations. Repair defective rings (about 2% of total).

8.7 For buoys with plastic mooring rings, the contractor will need to change the entire buoy if he notices the presence of anomalies.

8.8 Check and replace anodes (provided by CCG) on plastic buoys as needed and check the strength of their fasteners.

8.9 Ensure that the counterweight is properly secured by checking the bolts and brackets. Change the bolts and brackets if necessary (materials supplied by the contractor).

8.10 The buoy's skeletal structure must not have any deformations or any other defects that could affect its visual and mechanical performance. The bell-clappers (4) and the bell must be present and must not display any deformations or damage. Carry out the necessary repairs and, as needed, repaint the parts of the structure that have been repaired. Since the paint may contain lead, an appropriate mask is required.

8.11 Ensure that the counterweight is properly secured by checking the bolts and brackets. Change the bolts and brackets if necessary (materials supplied by the contractor).

8.12 For plastic buoys, the contractor will have to replace them if they observe anomalies that may affect their visual performance or their ability to float.

8.13 The buoy's identification plate must be well secured using pop rivets, and the lettering must be in good enough condition to prevent any confusion. If the lettering is damaged, the plate must be removed and submitted to the Canadian Coast Guard for repairs. Install the repaired plate on the buoy using rivets. The retroreflective material covering the identification plate must be in good condition. If it is damaged and not clearly visible, remove the plate and submit it to the Canadian Coast Guard for repairs. Install the repaired plate on the buoy using rivets.

8.14 Chains and bridles must be checked visually and measured using a template and must comply with the table of measurements provided by the Canadian Coast Guard **(Appendix B)**.

8.15 Damaged or overly worn chains and bridles will be replaced by the Canadian Coast Guard, and the contractor will hold them for later inspection and recovery by the Canadian Coast Guard.

8.16 Sinker hoisting eyes must be checked against the table of measurements in **Appendix C**. A strike with a hammer can be applied to the side of the eye to check for abnormal vibrations. If repairs are necessary, contact the Canadian Coast Guard representative.

8.17 Shackles and swivels must be free of deformations and their components must work freely and without excessive wear **(Appendix D)**. Defective components will be replaced by the

Canadian Coast Guard and held by the contractor for later inspection and recovery by the Canadian Coast Guard.

8.18 Shackle slit pins must be replaced annually (materials provided by the Canadian Coast Guard).

8.19 When the inspection and mechanical maintenance work is completed, attach labels to all equipment using nylon or steel ties (ties for potato sacks) to indicate that it is compliant. Label each sinker, chain and buoy. These labels, provided by the contractor, must be made of weatherproof material. They must indicate the **performance date** and the **inspector's name**.

8.20 **At no time, chains and crow's feet that no longer meet the requirements of the Canadian Coast Guard will not be used for any other purpose.**

9.0 ELECTRICAL MAINTENANCE

9.1 Lanterns should **NEVER** be opened.

9.2 Carmanah M850 / M860 lanterns must be returned in the container provided by Canadian Coast Guard and will be completely dark and will not see the light again. Canadian Coast Guard will pick them up before winter.

9.3 Before they are put back in place, self-contained lanterns must be reactivated by exposing them to sunlight for about 5 minutes. Return the lantern to darkness for 3 to 4 minutes to ensure that it is functioning according to the indicated characters. Reinstall the lantern.

9.4 Coast Guard will provide 4 spare M860 lanterns in case of breakdown or breakage. Two red lanterns, on Fl (4s), one q (1s) and two green F1 (4s) and one Q (1s). If one or these lanterns is used, the marine signals workshop must be informed (418-648-4821) regardless of the situation. The defective lantern must be returned immediately to the CCG at the expense of the latter, to Signaux maritimes, 101 Boulevard Champlain Québec, QC G1K 7Y7. Upon receipt, a replacement lantern will be returned immediately to meet future demand.

10 PAINTING

10.1 All painting materials (paint, solvent, rollers, brushes, paint guns, etc.) will be provided by the contractor. On even-numbered years (e.g. 2008, 2010) all starboard hand lateral buoys (red) are to be completely repainted. On odd-numbered years (e.g. 2011, 2013) all port hand lateral buoys (green) are to be completely repainted. All other non-lateral buoys which have names consisting of alphanumeric characters and are painted in two colours (red, green, yellow, white, black and orange), and winter spar buoys are to be completely repainted every year.

10.2 Any breaks in the surface greater than 12 square inches are to be repaired to prevent premature degradation of buoys that are not designated for complete repainting. Prepare the surface to be painted with a brush, mechanical or otherwise, to remove salt and rust. The parts to be repainted must also be washed with a solvent that promotes better paint adhesion.

10.3 The paint to be used for **summer buoys is a two-part epoxy**. The paint to be used for **winter buoys is an alkyd resin**. Before beginning the painting process, the contractor will inform the Canadian Coast Guard representative as to the paint manufacturer and product types in order to receive authorization from the Canadian Coast Guard representative to use those products.

10.4 The colours must comply with Canadian Coast Guard standards and U.S. Federal Standard 595B (FED-STD-595B).

Colour	U.S. Federal Standard 595B*
Red	11350
Green	14193
Yellow	13655
Black	17038
White	17925
Orange	22510

* U.S. Federal Standard 595B colours are available on the www.colorserver.net Website and from IHS Canada, 1-800-567-1914.

10.5 Painting work must comply with, but is not limited to, the manufacturer's standards (data sheet), meaning appropriate ventilation, temperature, humidity level and drying time. Consult the relevant manufacturer data sheets.

10.6 As needed, the Canadian Coast Guard will determine whether it is necessary to apply or reapply the high-performance coating to one or more buoys. Such work does not fall under these specifications and will be part of a separate contract.

11 STORAGE

11.1 The storage area must be accessible and permit the use of handling machinery at all times for maintaining and inspecting equipment. Arrange buoys in a way that allows the maximum amount of light to supply their solar collectors, meaning one of the collectors must face south. Store buoys and equipment on a smooth, well-drained surface (concrete, asphalt, gravel) to slow equipment degradation.

11.2 The equipment must be placed in a secure location that is dry and easily accessible. Both interior (lanterns, batteries) and exterior (chains, sinkers, shackles) storage spaces must be provided.

11.3 The buoys must be stored in a secure location to reduce the risk of equipment vandalism and theft.

12 CANADIAN COAST GUARD INSPECTION AND ACCEPTANCE

12.1 As often as deemed necessary and with prior notice, the Canadian Coast Guard representative will inspect the buoys and equipment to ensure that they are being maintained in compliance with these specifications.

12.2 The contractor will accompany the Canadian Coast Guard representative on request.

12.3 When the work has been completed, an acceptance is required to confirm that the work was performed according to Canadian Coast Guard requirements.

13 QUALIFICATIONS

13.1 Welding work must be performed by qualified personnel who are certified to work with steel and aluminum (CSA welding certification standard W47.1 division 2 and W47.2 division 2.1).

13.2 Electrical work must be performed by qualified, experienced personnel who comply with all laws and codes in force. **The contractor must demonstrate the qualification of his staff with the Canadian Coast Guard.**

14 HEALTH AND SAFETY

14.1 No welding work is permitted on the buoy's hull without previously checking for combustible gases **(Appendix A)**. To do so, the contractor must use an MSA model 2A explosimeter or equivalent. The Canadian Coast Guard will not provide this device.

14.2 Personnel must obtain from the manufacturers the material safety data sheets for the various products used. These products must be used according to the manufacturer's recommendations and disposed of in compliance with environmental legislation.

14.3 Personnel assigned to these tasks must be informed on how to handle measuring instruments, how to use equipment and tools, and how to properly wear personal protective equipment.

14.4 The contractor must comply with any hazard and/or safety advisories issued by the Canadian Coast Guard concerning the equipment under its care for maintenance or repairs.

15 DESCRIPTION OF BUOYS AND ACCESSORIES

15.1 **Appendix E** describes the procedure for inspecting the electrical system.

15.2 **Appendix F** describes the characteristics of buoys and accessories that fall under these tending specifications. This table allows the contractor to assess the scope of the work to be done.

15.3 **Appendix G** presents the different types of buoys that the contractor will have to maintain.

15.4 **Appendix H** contains drawings of buoy accessories that the contractor will have to inspect and replace each year as needed.

15.5 **Appendix I** is a typical buoy tending sheet that the contractor will have to complete for each buoy.

15.6 **Appendix J** contains a list of parts provided by the Canadian Coast Guard.

15.7 **Appendix K** Describes the method of replacing the eye of lifting sinker.

APPENDIX A

BUOY PURGING

1.0 SCOPE

This directive details the principles, responsibilities and procedures governing the maintenance and repair of buoys that contain or might contain combustible gases.

This directive governs the welding and cutting of buoys with metallic hulls and battery compartments; welding and cutting foam-filled buoys with a blowtorch; and opening battery compartments (e.g. to replace the batteries).

The purpose of this directive is to establish safety standards for personnel from the contractor and its successful tenderers, to be followed when performing buoy maintenance and/or repair work.

2.0 FRAMEWORK

The buoy's enclosed spaces (e.g. the hull and battery compartments) can contain combustible gases. Strong explosions and serious fires can result from the use of welding machines, cutting torches, or other sources of ignition (sparks) or occur when work is performed on these buoys. However, the danger that enclosed spaces represent can be mitigated if the necessary steps and precautions are taken. Toxic vapours can be produced by degrading polystyrene or polyurethane due to the heat produced when using a blowtorch to do welding or cutting work on a foam-filled buoy. The vapours and flammable or explosive gases below may form or be found in buoys:

a) Alcohols or combustible aliphatic esters may form within buoys with inner painted surfaces;

b) Combustible vapours may be present in buoys with inner surfaces treated with anti-rust coatings or solvents;

c) Combustible vapours may be formed during torch welding or cutting operations on buoys with inner surfaces treated with linseed oil or other low-volatility products;

d) Acetylene may be present or enclosed in buoys previously equipped with gas lanterns;

e) Hydrogen may be present in buoys because of battery leaks and/or seawater electrolysis.

3.0 PRINCIPLES

3.1 Checking for combustible gases

No buoy should be presumed clean or safe until all enclosed spaces (e.g. hull and battery compartments) are proven so by proper testing. Tests of the buoy's atmosphere must comply with the testing procedures outlined in this directive.

3.2 Buoy purging

Buoys containing flammable/explosive vapours or gases must be purged in compliance with the procedures in this directive. There are several methods of preparing a buoy for safe work. They range from complete decontamination (i.e. water flushing, steaming, chemical cleaning

and air purging) to blanketing with inert gases. In general, purging methods that consist of replacing flammable vapours with outside air or blanketing with inert gases are appropriate.

4.0 RESPONSIBILITIES

4.1 Contractor

The contractor must:

a) be knowledgeable about the following regulations and standards:

- Canada Confined Spaces Regulations;
- Canada Occupational Health and Safety Regulations
- CSA standard W117.2-2012
- Standard ANSI/AWS F4.1
- Standard NFPA 327

b) ensure that employees understand and comply with all applicable safety procedures;

c) ensure that employee health and safety regulations are enforced;

d) ensure that appropriate safety equipment is available and used properly.

4.2 Canadian Coast Guard

The Canadian Coast Guard representative will provide the contractor with all relevant information on this subject.

5.0 PROCEDURES

5.1 Preliminary activities

Prior to any work on or servicing of buoys, it is necessary to be aware of and to be able to identify any hazards that may exist. Knowledge of the various regulations and standards is necessary to safely mitigate these hazards.

5.2 Controlling sources of ignition

When a buoy might contain hazardous substances, the contractor must ensure that there are no sources of ignition (smoking, welding, grinding, running compressor, etc.) within a radius of at least 6 metres from the buoy. It is easier to remove ignition sources by placing the buoy outdoors.

5.3 Buoy preparation

A combustible gas detector must be used to check for explosive gases within the buoy's compartments. If explosive gases are found, these compartments must be ventilated, i.e. the gas must be flushed out using compressed air until the detector indicates that the percentage of explosive gases is zero.

5.4 Welding, cutting and drilling on metal buoys

5.4.1 Welding and cutting buoys filled with foam.

Welding or torch cutting of buoys filled with foam should never be allowed. See Article 3.1 of this annex

5.4.2 Preliminary activities and buoy preparation

Before blowtorch welding or cutting and/or drilling on metal buoys, compliance must be ensured with the procedures above in 5.2 Controlling sources of ignition and 5.3 Buoy preparation.

5.4.3 Welding, cutting and/or other hot work on external surfaces

Before welding or cutting with a blowtorch or performing any other hot work on a compartment's external surfaces, check for the presence of explosive gases within the compartments. If the detector indicates the formation of a hazardous amount of combustible gas, cease the activity and purge the compartment until the detector indicates a non-hazardous amount of gas.

If a hazardous quantity of combustible gas forms again after activity resumes, the compartment must be blanketed with inert gas.

5.4.4 Welding, cutting and/or other hot work on internal surfaces.

Under this mandate there is no work to be done inside the buoys except for the purge. However, if the condition of a buoy recommends the opening of a manhole cover plate, the contractor must then obtain from Canadian Coast Guard the instruction to be followed for this purpose.

6.0 NEUTRALIZATION

6.1 Completely purging a container (buoy compartment) is still the most reliable way to prepare for performing hot work. However, some containers are very difficult to completely decontaminate. In these cases, if the hot work is limited to external surfaces, neutralization can make the container safe for work. Neutralization (or inerting) involves replacing the air and hazardous gases in the container with an inert gas and maintaining an inert atmosphere during hot work.

6.2 Steam, nitrogen gas or carbon dioxide can be circulated in the container to neutralize the atmosphere while performing hot work. Solid carbon dioxide in the form of dry ice can also be used. If dry ice is used, a special check valve is required to maintain an inert atmosphere in the container and regulate the increased pressure from the gas's expansion.

7.0 SAFETY MEASURES

7.1 Any personnel who use the neutralization procedure must comply with the standards in effect. All staff using the neutralization process should be familiarize with the Ministry of Labor reference document, PURGING Vessels which have been contaminated by hazardous substance.

7.2 Neutralization requires a well-ventilated location where it is unlikely that there will be a lack of oxygen and worker exposure to the inert gas can be controlled and kept to a minimum. To prevent the generation of static electricity, connect the container to the tubing for the inert gas and ground the container. Dry ice used to create an inert atmosphere can cause burns from the cold, and gloves are required to handle it.

8.0 REFERENCES

8.1 TP1526. Transport Canada. Aids and Waterways policy item. A28, dated December 22, 1982. "Buoy Servicing – Purging of Hazardous Combustible Gases."

APPENDIX B

Minimum acceptable diameters for common links, end links, rings, eyes, collars, bridles and swivels

Nominal diameter for the chain, bridle and swivel	Minimum diameter for common links		Minimum diameter for end links, rings, eyes and collars	
(in.)	(in.)	(mm)	(in.)	(mm)
1 / 2	13 / 32	10	1 / 2	13
3 / 4	14 / 32	15	23 / 32	18
1- 1 / 8	15 / 16	24	1	25
1- 1 / 2	1- 7 / 32	31	1- 17 / 32	39

APPENDIX C

Minimum acceptable diameters for anchor and sinker hoisting eyes

Nominal mass of anchor or sinker	Minimum diameter of hoisting eye	
(lbs)	(in.)	(mm)
8,000	1- 1 / 16	27
6,500	15 / 16	24
6,000	29 / 32	23
5,000	27 / 32	21
4,500	25 / 32	20
4,000	3 / 4	19
3,500	11 / 16	18
3,000	5 / 8	16
2,500	19 / 32	15
2,000	17 / 32	14
1,800	1 / 2	13
1,500	15 / 32	12
1,200	13 / 32	10
1,000	13 / 32	10
800	11 / 32	9
500	9 / 32	7
300	1 / 4	6

APPENDIX D

Minimum acceptable diameters for shackle pins

Nominal diameter	Bridle shackle (not applicable)		Bow shackle	
(in.)	(in.)	(mm)	(in.)	(mm)
5 / 8	5 / 8	16	9 / 16	14
3 / 4	21 / 32	17	21 / 32	17
7 / 8	13 / 16	21	-	-
1	31 / 32	25	7 / 8	22
1-1 / 4	1-3 / 16	30	1- 1 / 16	26
1-1 / 2	1-3 / 8	35	1- 11 / 32	34
1-3 / 4	-	-	1- 11 / 16	43
2	-	-	1- 3 / 4	44

APPENDIX E

ELECTRICAL SYSTEM INSPECTION PROCEDURE

Characters used by the CCG:

- FL 4S (0.50sec ON, 3.50sec OFF)
- Q 1S (0.30sec ON, 0.70sec OFF)

APPENDIX F

TABLE OF BUOYS AND ACCESSORIES
LOWER NORTH SHORE, NORTH SHORE AND GASPÉSIE

Note	Code	Buoy colour and function (counterweight)	Type of aid	Sinker	Buoy line (chain)	Light	Lantern (type)
	BMING	west cardinal Y and B	2.9 m bell	Cast iron 6,000 lbs	Chain – 1 1/8 / 120 ft	Q(9) 15S	Carmanah M860
	BRA	fairway R and W	2.9 m bell	Cast iron 6,500 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
	C-10	starboard R	2.9 m	Cast iron 8,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
2)	**C-64**	starboard R	2.9 m	Cast iron 5,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
	C-80	starboard R	2.9 m	Cast iron 6,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
	C-81	port G	SB-98	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	C-84	starboard R	2.9 m	Cast iron 6,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
	CB-2	starboard R (**250 lbs**)	SB-1500	Cast iron 4,000 lbs	Chain – 3/4 / 180 ft	FL 4S	Carmanah M860
	CJ-5	port G (**500 lbs**)	SB-1500	Cast iron 3,000 lbs	Chain – 3/4 / 90 ft	FL 4S	Carmanah M860
	CK-1	port G	2.9 m bell	Cast iron 4,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
	CM-10	starboard R (**500 lbs**)	SB-1500	Cast iron 3,000 lbs	Chain – 3/4 / 180 ft	FL 4S	Carmanah M860
	CM-12	starboard R (**250 lbs**)	SB-1500	Cast iron 4,000 lbs	Chain – 3/4 / 180 ft	FL 4S	Carmanah M860
	CM-16	starboard R	2.9 m bell	Cast iron 6,000 lbs	Chain – 1 1/8 / 60 ft	FL 4S	Carmanah M860
	CM-17	port G	1.8 m buoy	Cast iron 4,000 lbs	Chain – 1 1/8 / 60 ft	FL 4S	Carmanah M860
	CM-28	starboard R	2.9 m	Cast iron 6,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
	CM-5	port G (**250 lbs**)	SB-1500	Cast iron 3,000 lbs	Chain – 3/4 / 150 ft	FL 4S	Carmanah M860
	CN-2	starboard R	1.8 m buoy	Cast iron 4,000 lbs	Chain – 1 1/8 / 90 ft	FL 4S	Carmanah M860
2)	**CN-8**	starboard R (**250 lbs**)	SB-1500	Cast iron 3,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	CT-11	port G	SB-98	Cast iron 2,000 lbs	Chain – 3/4 / 90 ft	FL 4S	Carmanah M860
2)	**CT-7**	port G (**250 lbs**)	SB-1500	Cast iron 4,000 lbs	Chain – 3/4 / 180 ft	FL 4S	Carmanah M860
	CU-2	starboard R	SB-98	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	CU-27	port G	SB-98	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	CU-35	port G (**250 lbs**)	SB-1500	Cast iron 2,000 lbs	Chain – 3/4 / 150 ft	FL 4S	Carmanah M860
	CY-10	starboard R	1.2 m MOBILIS BC-1241	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	CY-9	port G	1.2 m MOBILIS BC-1241	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
2)	**RAT**	fairway R and W	2.9 m bell	Cast iron 6,000 lbs	Chain – 1 1/8 / 120 ft	MO (A) 6S	Carmanah M860
2)	**SABLO**	fairway R and W	2.9 m bell	Cast iron 6,000 lbs	Chain – 1 1/8 / 150 ft	MO (A) 6S	Carmanah M860
	STAUG	fairway R and W	2.9 m	Cast iron 8,000 lbs	Chain – 1 1/8 / 180 ft	MO (A) 6S	Carmanah M860

Note	Code	Buoy colour and function (counterweight)	Type of aid	Sinker	Buoy line (chain)	Light	Lantern (type)
1)	**BASQ-E**	port bifurcation R and G	2.9 m	Cast iron 8,000 lbs	Chain – 1 1/8 / 180 ft	FL (2+1) 6S	Carmanah M860
1)	**BASQ-O**	starboard bifurcation R and G	2.9 m	Cast iron 8,000 lbs	Chain – 1 1/8 / 270 ft	FL (2+1) 6S	Carmanah M860
2)	**D-11**	port G	2.9 m	Cast iron 6,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
1)	**D-15**	port G	2.9 m	Cast iron 6,000 lbs	Chain – 1 1/8 / 90 ft	Q 1S	Carmanah M860
1)	**D-20**	starboard R	1.8 m buoy	Cast iron 8,000 lbs	Chain – 1 1/8 / 90 ft	FL 4S	Carmanah M860
	D-4	starboard R	1.8 m buoy	Cast iron 4,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
	D-6	starboard R	2.9 m bell	Cast iron 8,000 lbs	Chain – 1 1/8 / 270 ft	FL 4S	Carmanah M860
1)	**D-7**	port G	1.8 m buoy	Cast iron 8,000 lbs	Chain – 1 1/8 / 180 ft	FL 4S	Carmanah M860
1)	**PTCAR(P)**	fairway R and W	2.9 m bell	Cast iron 8,000 lbs	Chain – 1 1/8 / 180 ft	MO (A) 6S	Carmanah M860
	K-14	starboard R	2.9 m	Cast iron 8,000 lbs	Chain – 1 1/8 / 270 ft	FL 4S	Carmanah M860
1)	**KA-12**	starboard R	1.8 m buoy	Cast iron 8,000 lbs	Chain – 1 1/8 / 90 ft	FL 4S	Carmanah M860
1)	**KA-13**	port G	1.8 m buoy	Cast iron 8,000 lbs	Chain – 1 1/8 / 90 ft	FL 4S	Carmanah M860
1) 2)	**KD-14**	starboard R	2.9 m bell	Cast iron 8,000 lbs	Chain – 1 1/8 / 360 ft	FL 4S	Carmanah M860
1)	**KD-6**	starboard R	1.8 m New Tube Buoy	Cast iron 8,000 lbs	Chain – 1 1/8 / 90 ft	FL 4S	Carmanah M860
	KD-7	port G	1.8 m New Tube Buoy	Cast iron 5,000 lbs	Chain – 1 1/8 / 90 ft	FL 4S	Carmanah M860
	AA-1	port G (**250 lbs**)	SB-1500	Cast iron 3,500 lbs	Chain – 3/4 / 90 ft	FL 4S	Carmanah M860
	AB-1	port G	1.2 m MOBILIS BC-1241	Cast iron 1,500 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	AF-1	port G	1.2 m MOBILIS BC-1241	Cast iron 2,000 lbs	Chain – 3/4 / 90 ft	FL 4S	Carmanah M860
1)	**AN-1**	port G	1.2 m MOBILIS BC-1241	Cast iron 2,000 lbs	Chain – 3/4 / 90 ft	Q 1S	Carmanah M860
1)	**AN-3**	port G	1.2 m MOBILIS BC-1241	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	Q 1S	Carmanah M860
	AN-4	starboard R	1.2 m MOBILIS BC-1241	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	BR2	starboard R	Jet 2500 Mobilis	Cast iron 6,000 lbs	Chain – 1 1/8 / 60 ft	FL 4S	Carmanah M860
	AP-2	starboard R	Jet 2500	Cast iron 6,000 lbs	Chain – 1 1/8 / 120 ft	Q 1S	Carmanah M860
	CLORI	fairway R and W	2.9 m	Cast iron 5,000 lbs	Chain – 1 1/8 / 90 ft	MO (A) 6S	Carmanah M860
	HD-8	starboard R	1.8 m buoy	Cast iron 4,000 lbs	Chain – 1 1/8 / 90 ft	FL 4S	Carmanah M860
1)	**HD-9**	port G	1.8 m buoy	Cast iron 8,000 lbs	Chain – 1 1/8 / 120 ft	FL 4S	Carmanah M860
2)	**MENIER**	fairway R and W	2.9 m bell	Cast iron 6,000 lbs	Chain – 1 1/8 / 120 ft	MO (A) 6S	Carmanah M860
	NEWPO	fairway R and W	2.9 m bell	Cast iron 6,000 lbs	Chain – 1 1/8 / 180 ft	MO (A) 6S	Carmanah M860
	PM-11	port G (**250 lbs**)	SB-1500	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860
	PM-9	port G (**250 lbs**)	SB-1500	Cast iron 2,000 lbs	Chain – 3/4 / 60 ft	FL 4S	Carmanah M860

Note	Code	Buoy colour and function (counterweight)	Type of aid	Sinker	Buoy line (chain)	Light	Lantern (type)
	Spar	**HD-9**	G				
	Spar	**AN-3 (500 lbs)**	0.7 m short G				
	Spar	**AN-1 (250 lbs)**	0.7 m short G				
	Spar	**KD-6**	R				
	Spar	**KD-14**	R				
	Spar	**KA-13**	G				
	Spar	**KA-12**	R				
	Spar	**PTCAR**	RW				
	Spar	**D-7**	G				
	Spar	**D-20**	R				
	Spar	**D-17**	G				
	Spar	**D-15**	G				
	Spar	**BASQ-O**	RGR				
	Spar	**BASQ-E**	GRG				

1) Winter spar buoys. The Contractor will only check the sinker and buoy line for this buoy every two years.

2) The buoys are equipped with anchor points for thermographs; see Appendix G.

LEGEND

R: Red

W: White

G: Green

B: Black

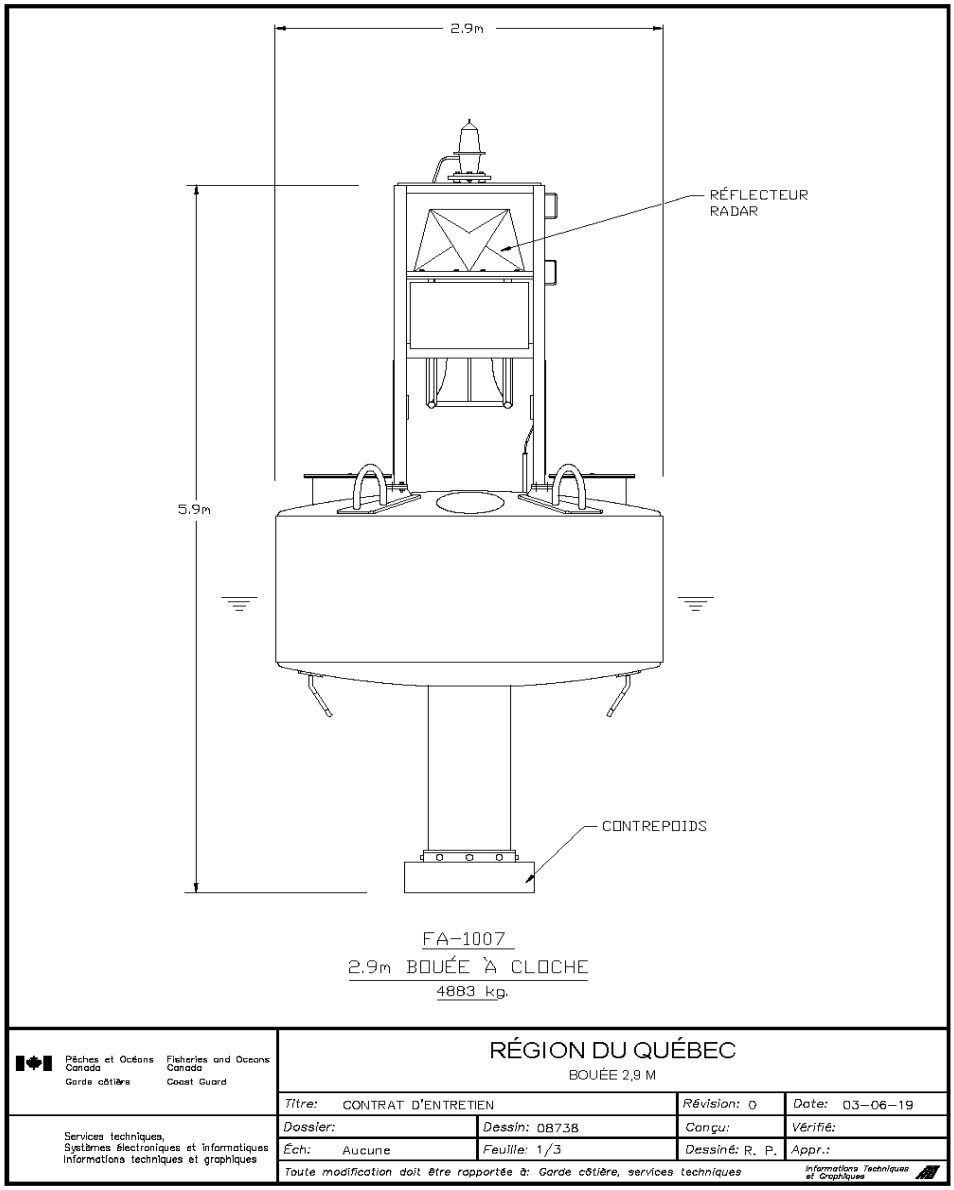
Y: Yellow

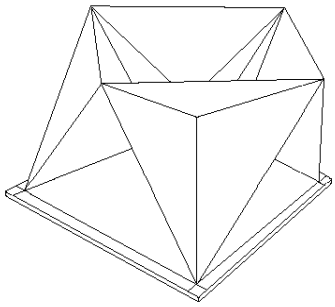
Characteristics

FL4s = 5sec obs. 3.5sec
Q 1s = 5,3s obs. 0,7sec.

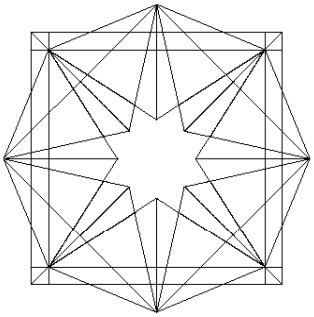
APPENDIX G

BUOY DRAWINGS

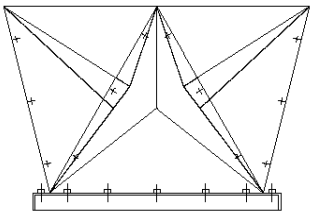




VUE PERSPECTIVE



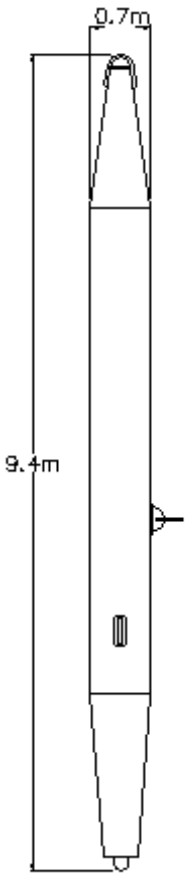
VUE EN PLAN



VUE EN ÉLÉVATION

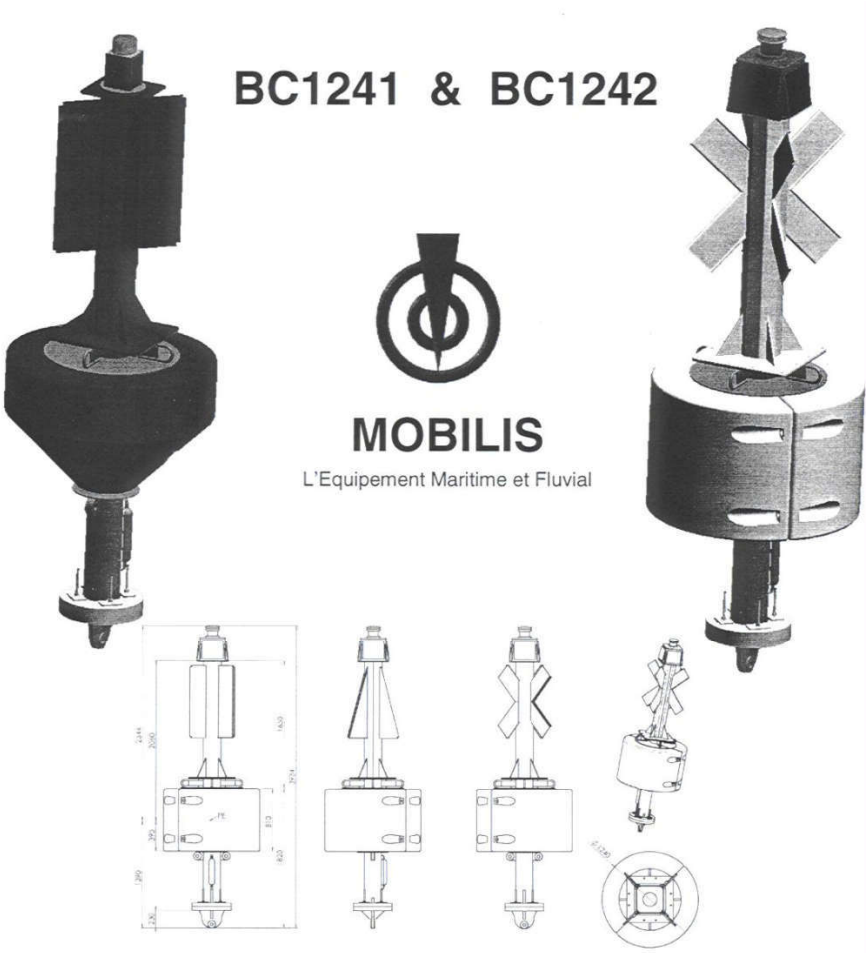
Pêches et Océans Canada / Fisheries and Oceans Canada Garde côtière / Coast Guard	RÉGION DU QUÉBEC RÉFLECTEUR RADAR			
	Titre: CONTRAT D'ENTRETIEN		*Révision:* 0	*Date:* 03-06-19
Services techniques, Systèmes électroniques et informatiques Informations techniques et graphiques	*Dossier:*	*Dessin:* 08738	*Conçu:*	*Vérifié:*
	Éch: Aucune	*Feuille:* 2/3	*Dessiné:* R. P.	*Appr.:*
	Toute modification doit être rapportée à: Garde côtière, services techniques			Informations Techniques et Graphiques

BUOY DRAWINGS
TYPES



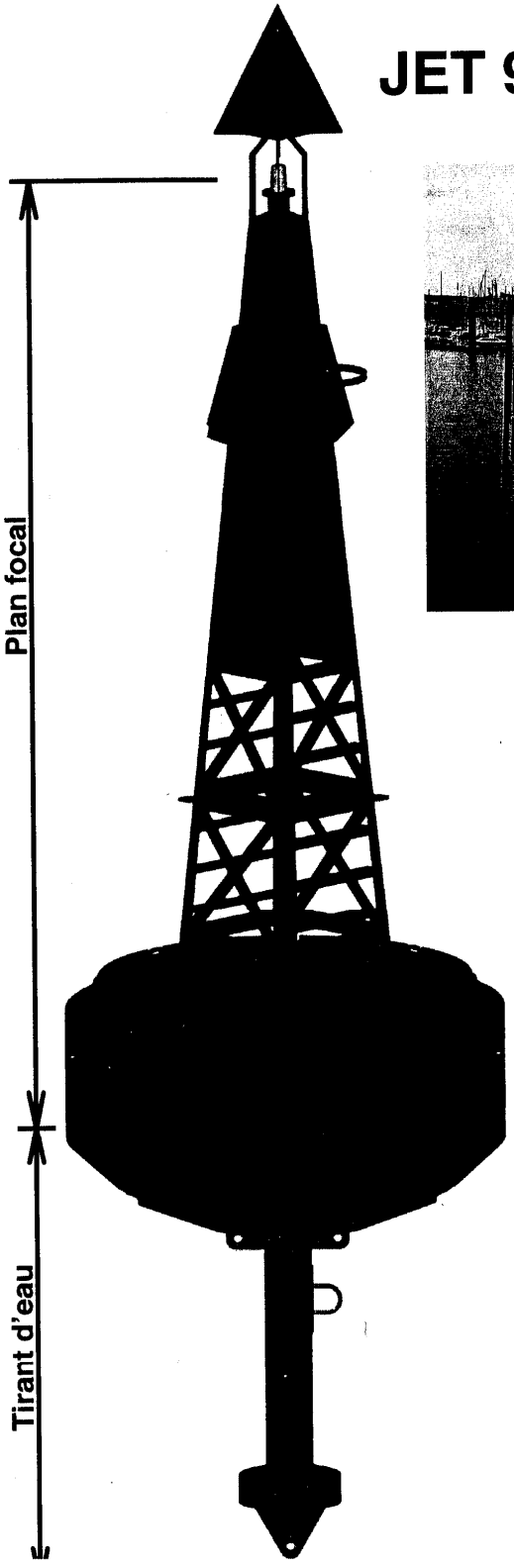
FA-3004
0.7m ICE BUOY
CONICAL VERSION
0.7m BOUÉE D'HIVER
VERSION CONIQUE
1946 kg

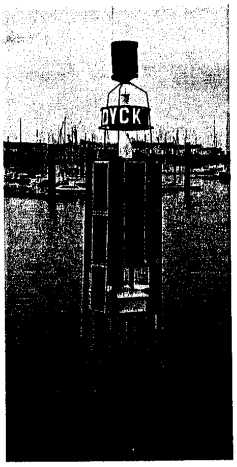
BUOY DRAWINGS
TYPES

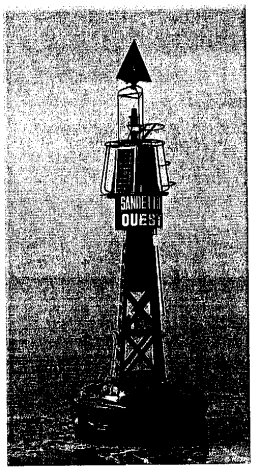


Spécifications	BC1241	BC1242
Application	Haute mer, Côtier	Haute mer, Côtier
Matériaux	polyéthylène, Aluminium et Acier	polyéthylène, Aluminium et Acier
Marques	Lat., St-André	Lat., St-André
Diamètre	1,24 m	1,24 m
Hauteur	3,9 m	3,9 m
tirant d'eau	1,7 m	1,4 m
Plan focal	2,2-1,9 m	2,5-2,2 m
Période de roulis	environs 7 s	environs 7 s
Poids Bouée	360 kg sans ballast	380 kg sans ballast
Poids Ballast	100 kg	100 kg

JET 9000 QI PF6







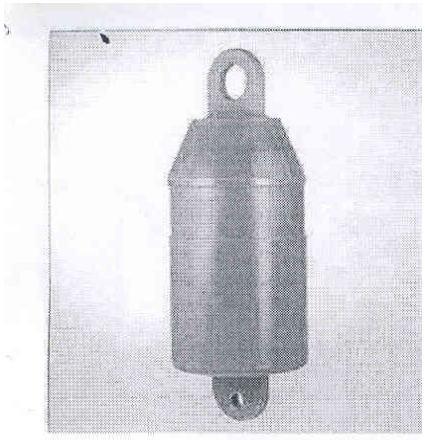
MOBILIS

L'Equipement Maritime et Fluvial

Spécifications

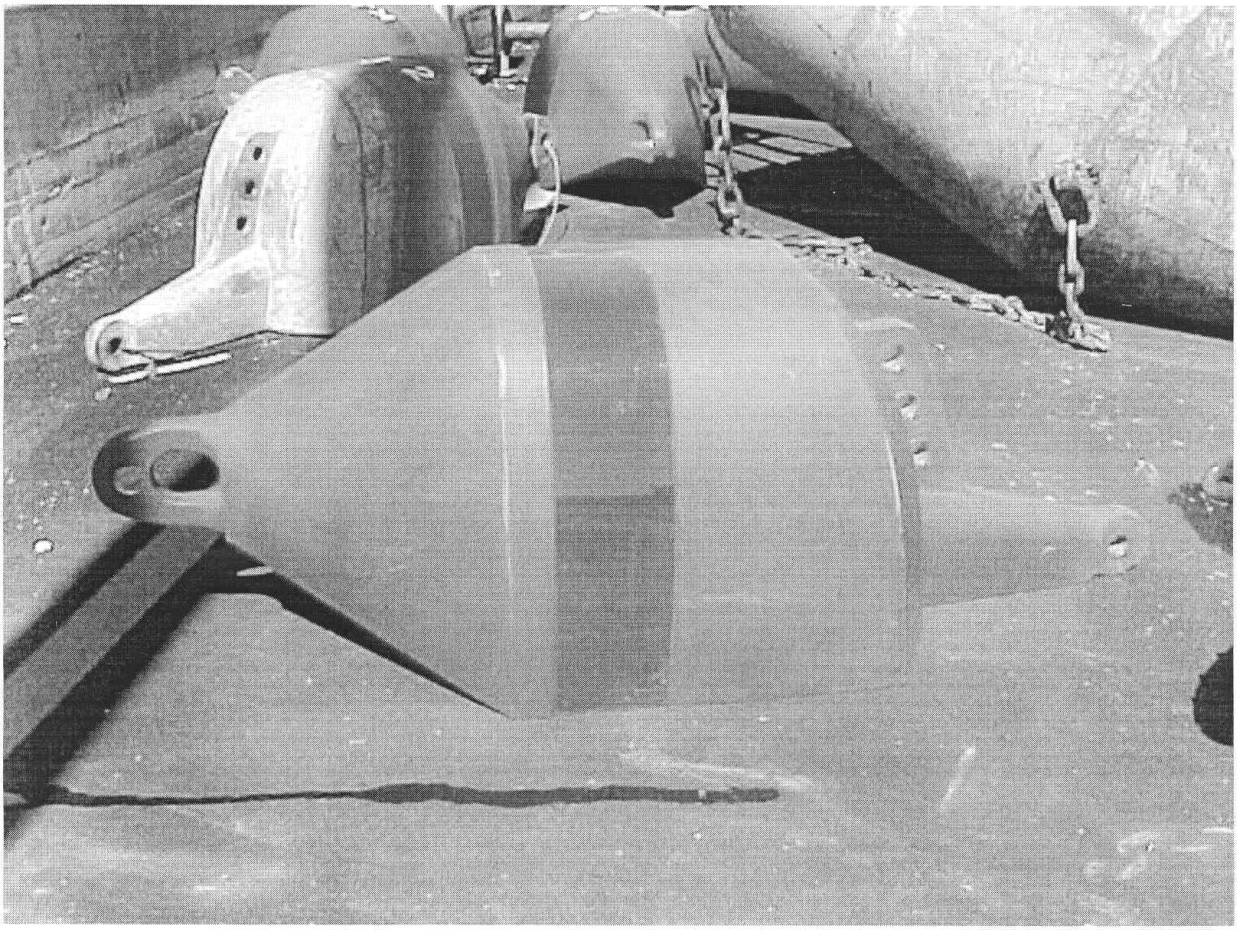
Application	Haute mer, Côtier
Matériaux	polyéthylène, Aluminium et Acier
Marques	Lat., St-André, Card., Danger etc.
Diamètre	3.0 m
Hauteur	10.5 m
tirant d'eau	4.3 m
Plan focal	6 - 7 m
Période de roulis	environs 5 s
Poids Bouée	2000 kg sans ballast
Poids Ballast	500 kg

SB-40

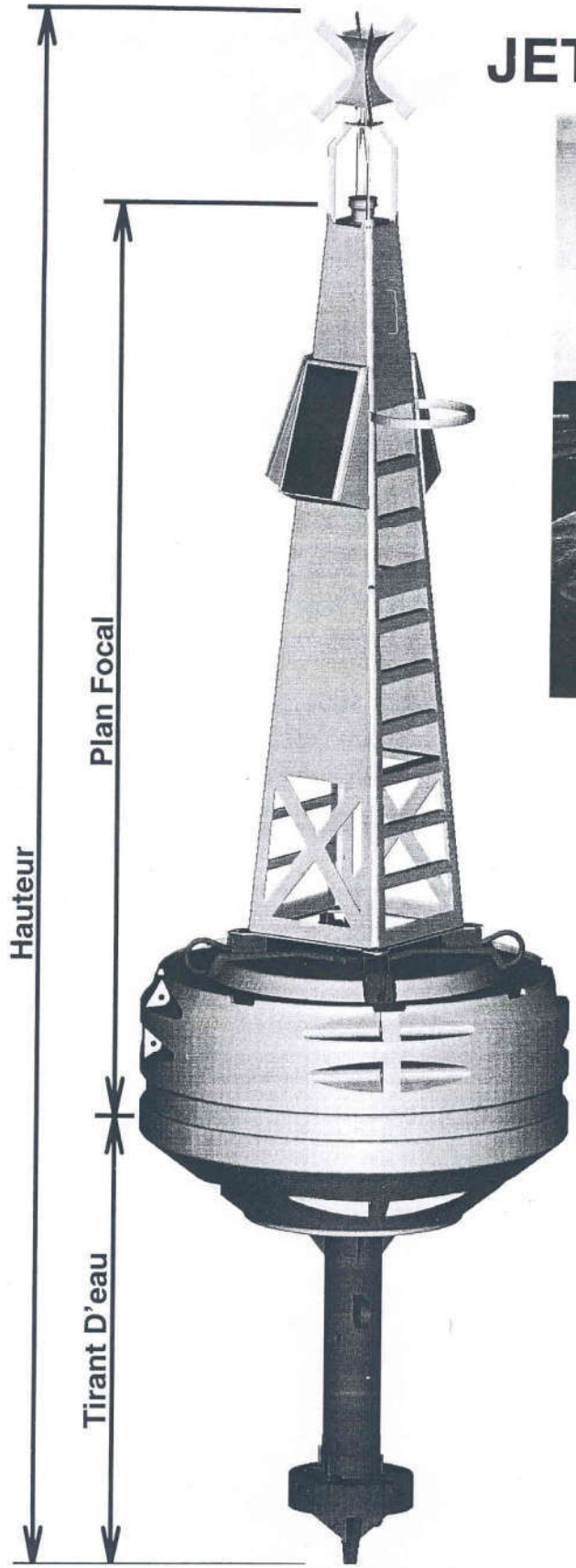


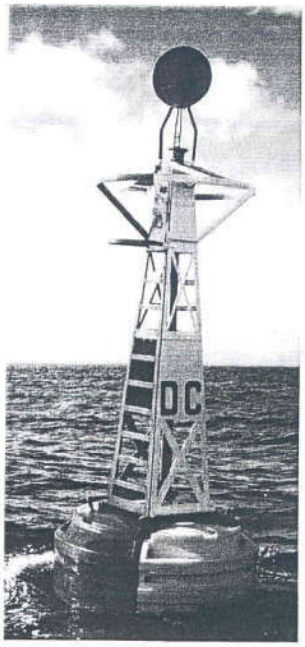
SB-1400

SB-101



JET 5000 QI PF5





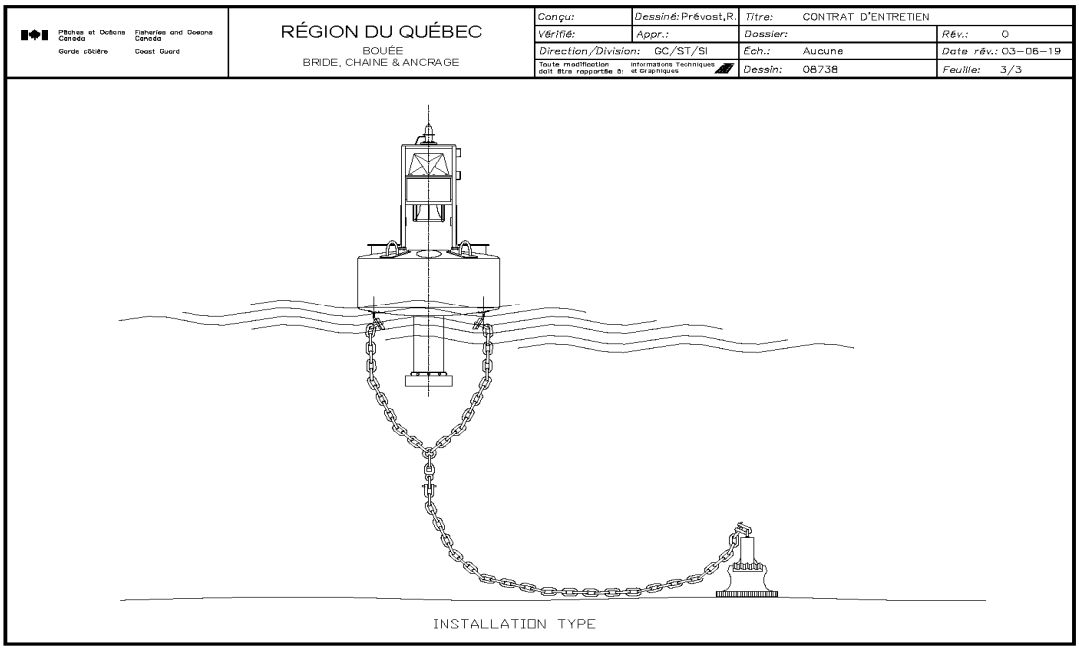
MOBILIS

Equipement Maritime et Fluvial

Spécifications	JET5000 QI PF5
Application	Haute mer, Côtier
Matériaux	Polyéthylène, Aluminium et Acier
Marques	Lat., St-André, Card., Danger etc.
Diamètre	2,4 m
Hauteur	8,9 m
Tirant d'eau	2,7 m
Plan focal	5 m
Poids Bouée	1500 kg sans ballast
Poids Ballast	400 kg
Periode de roulis	environs 4 s

APPENDIX H

(Overview)



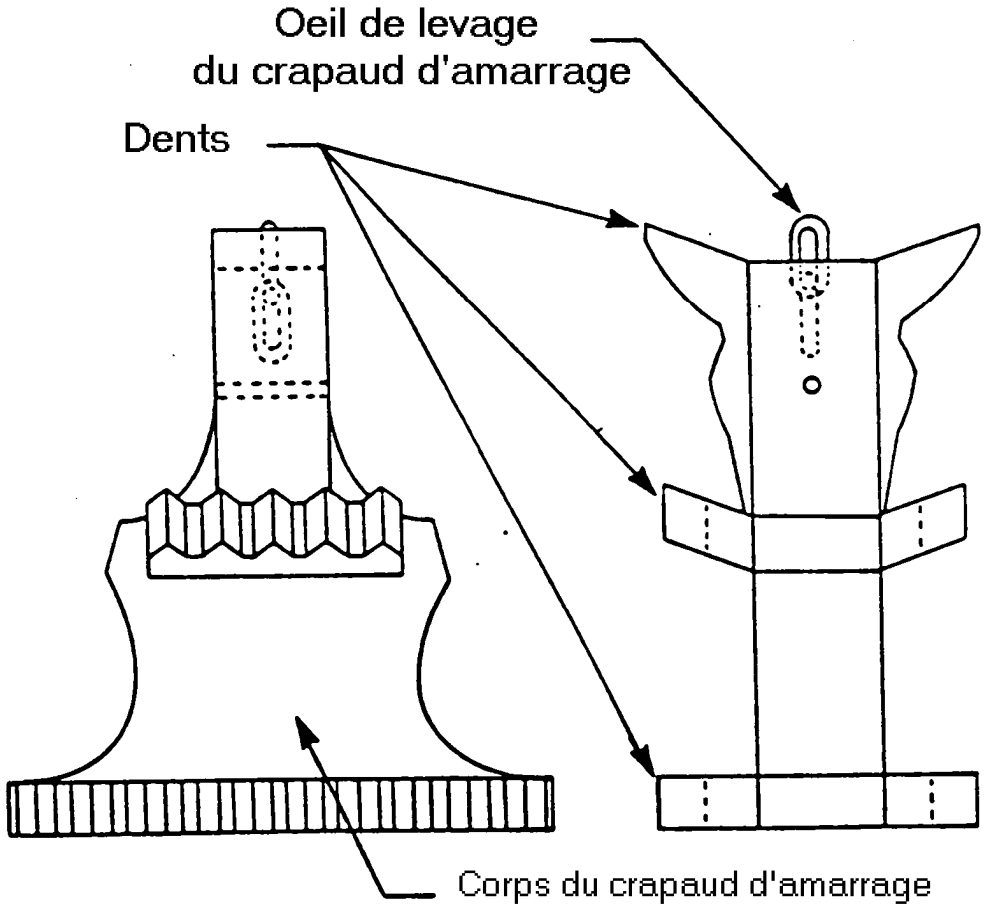
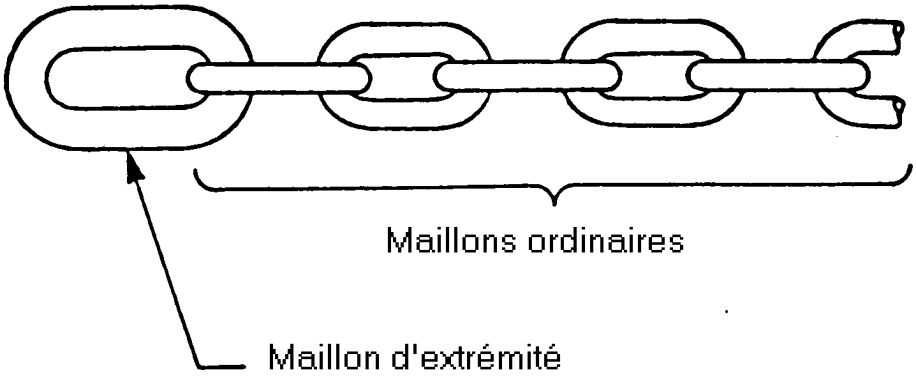
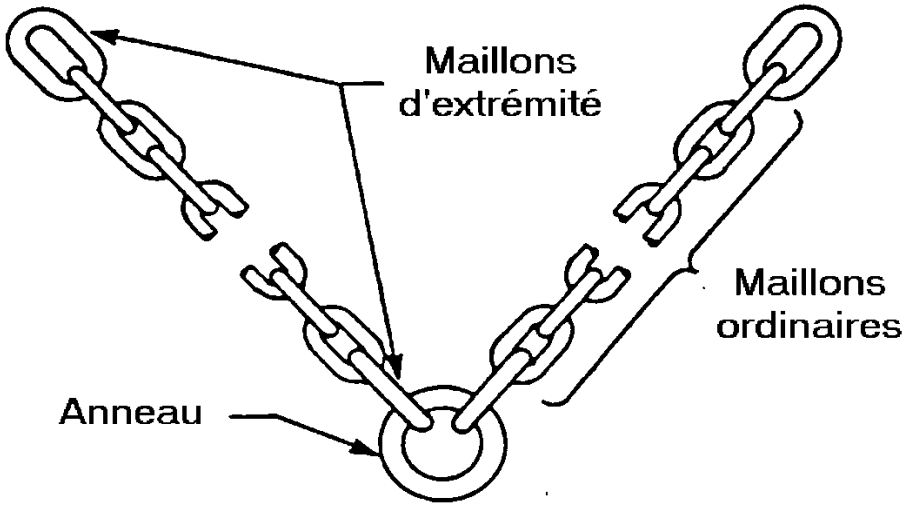


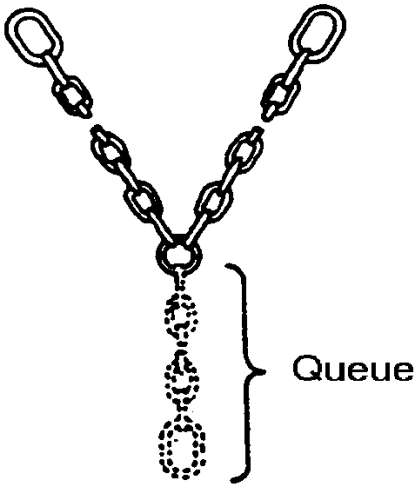
Figure 2 : Parties d'une chaîne



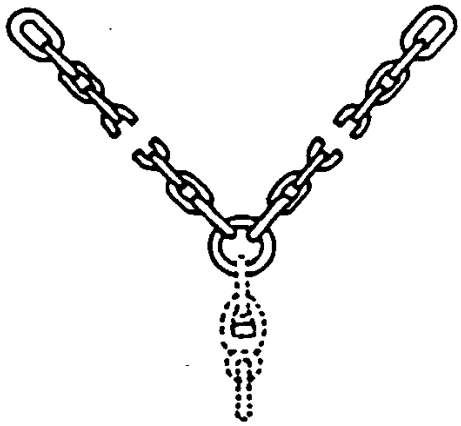
ACCESSORY DRAWINGS



Pattes d'oie en V

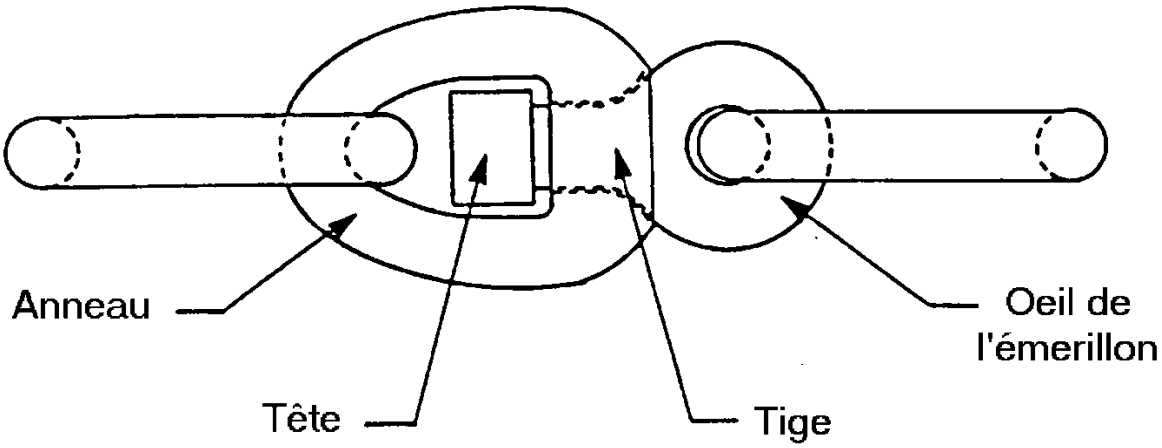


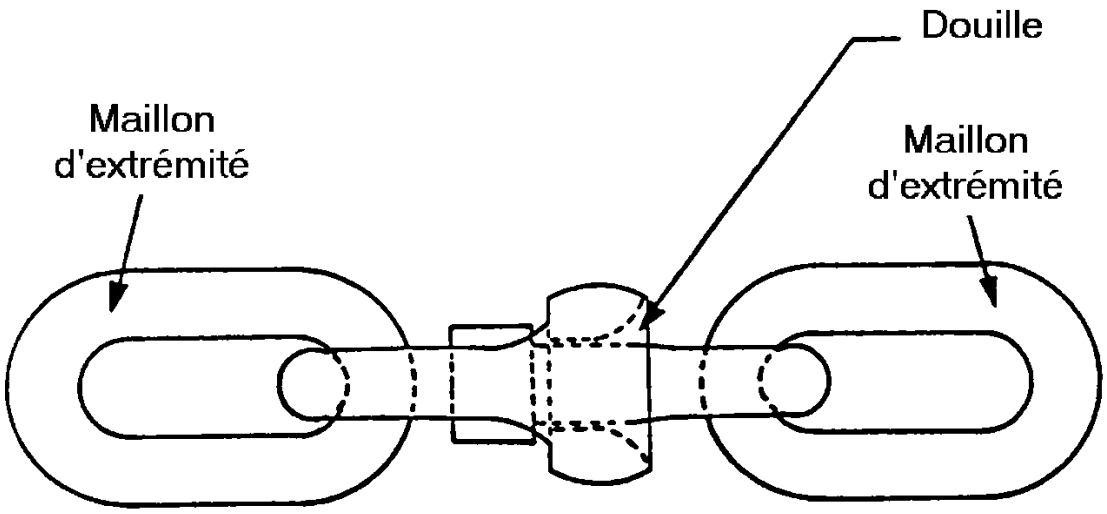
Pattes d'oie en Y



Pattes d'oie en V et émerillon

ACCESSORY DRAWINGS





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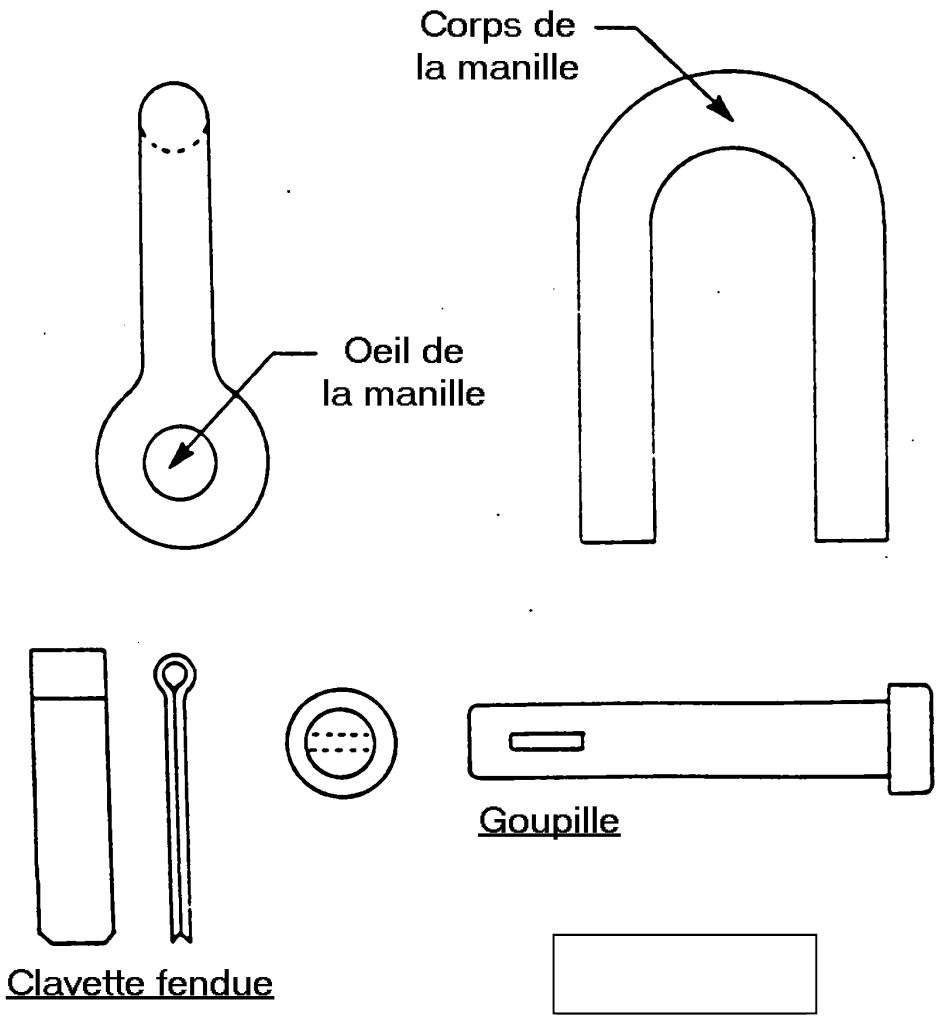
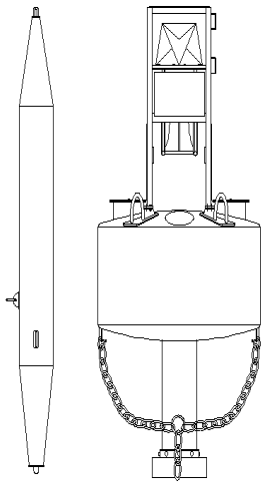


APPENDIX I

BUOY TENDING SHEET

PLANNED MAINTENANCE ☐
UNPLANNED MAINTENANCE ☐

POSITION: _____ SERIAL NO: _____ COLOUR: _____ TYPE: _____	**HULL** ☐ COUNTERWEIGHT ☐ LOWER CYLINDER ☐ UPPER HULL ☐ HOISTING EYE ☐ BRIDLE RING	**BRIDLE** ☐ SWIVEL ☐ SHACKLE ☐ CHAIN LINK ☐ ASSEMBLY LINK ☐ END LINK ☐ RING	
STRUCTURE ☐ RADAR REFLECTOR ☐ BELL ☐ ANGLE IRON ☐ IDENTIFICATION PLATE ☐ LANTERN PLATE ☐ FOOT	**ELECTRICITY** ☐ LANTERN ☐ SOLAR COLLECTOR ☐ CONDUIT ☐ WIRING ☐ CONNECTOR ☐ VOLTAGE _____	**PAINT** ☐ SANDING ☐ PRIMER ☐ FINISH ☐ LETTERING	

NOTES
GAS TEST
RING TEST
PRESSURE TEST

COST			
	LABOUR	MATERIALS	PAY / HR
WELDING			
ELECTRICITY			
PAINTING			
OTHERS			
TOTAL			

SIGNATURE		**DATE**
WELDING		
ELECTRICITY		
PAINTING		

APPENDIX J

List of parts provided by the Canadian Coast Guard

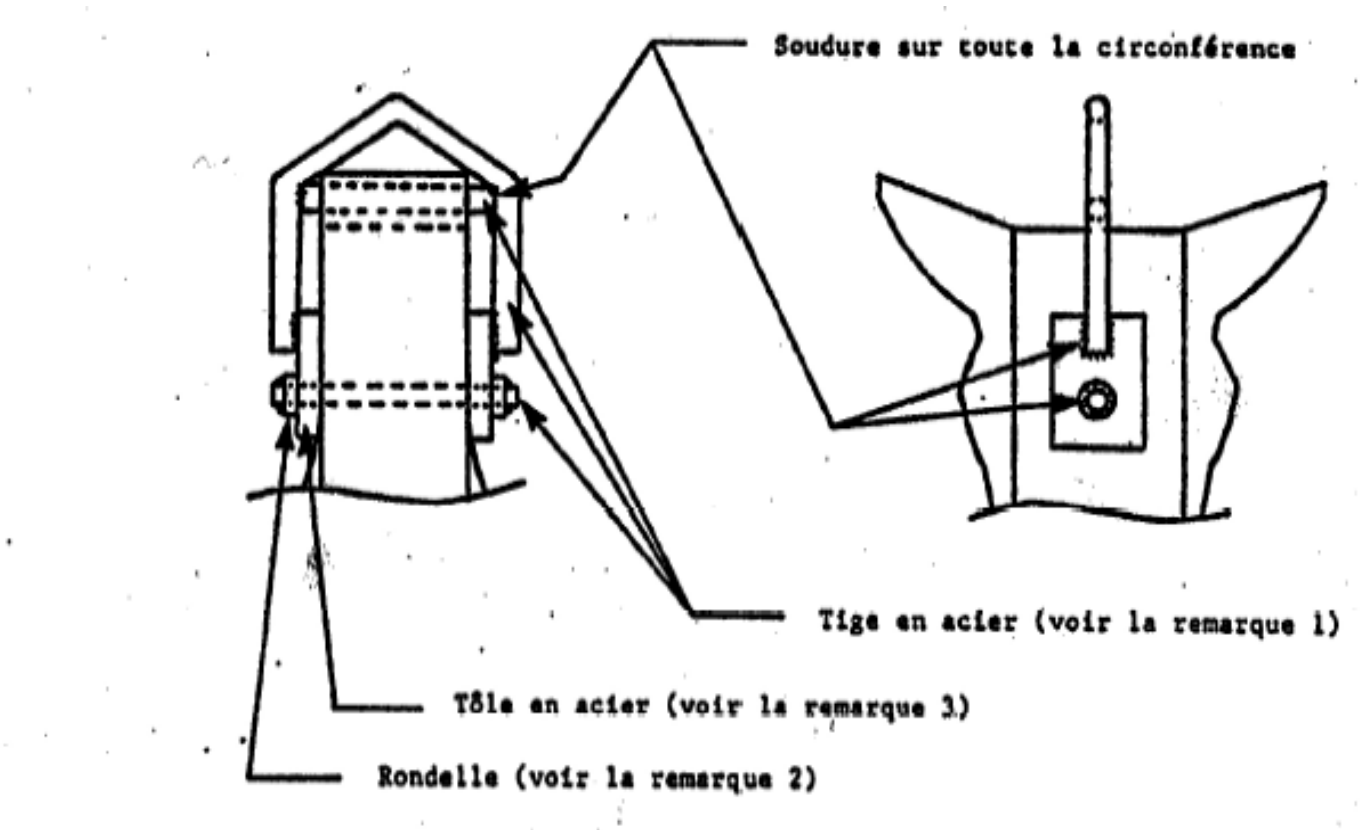
List of parts and equipment provided to the Contractor after the equipment inspection mentioned in 3.1 and 4.5 of these specifications.

These parts will be provided when the contract is awarded and on request, and changed parts must be kept and returned to the Canadian Coast Guard if the Canadian Coast Guard representative so requests. The department will transport, at its convenience, the parts required by the contractor

- Lantern
- Towers
- Bells
- Radar reflectors
- Shackles
- Swivels
- Latches
- Pins
- Rings
- Chain shackles
- Bridles
- Chains
- Anodes
- Counterweights
- Plate and lettering
- 3M retroreflective tape

Appendices K

**" Arceau de levage " en remplacement
de l'œil de levage d'un crapaud**



Remark 1: The diameter of the steel rod must be at least equal to the initial lifting diameter, as detailed in APPENDIX C.

Remark 2: The contractor must procure the washers on the market or cut them out of steel sheets. Their thickness must be of at least three eights (3/8th) that of the steel rod and their diameter must be equal to two (2) times that of that same steel rod.

Remark 3: The steel sheets must be cut in a sheet of which the thickness is of at least three eights (3/8th) the diameter of the steel rod. They must be at least four (4) times larger and at least six (6) tomes longer than the diameter of the steel rod.

ANNEX «B » - BASIS OF PAYMENT

Payment for work will be made in three installments: one payment (20%) after the inspection and receipt of the report by the CCG, a second (60%) after maintenance of buoys and accessories and the third (20%) after complete delivery to the vessel for mooring program.

The payment of the works will be done according to the following dates :

March 15: summer buoys according to the fee schedule
October 15: winter buoys according to the fee schedule

TABLE 1
From date of contract award to September 30, 2020

Article	Buoys type	Qty	Firm Unit price	Calculated price (x firm Unit Price)
1.	2.9m	23	$	$
2.	SB- 1500	11	$	$
3.	1.8m	11	$	$
4.	Sb-98 tideland	4	$	$
5.	1.2 m mobilis	7	$	$
6.	Jet 2500	1	$	$
7.	Jet 5000	1	$	$
8.	Winter spars	13	$	$
	Total			$ CAD

TABLE 2

Optional year #1

From October 1er, 2020 to September 30, 2021

Article	Buoys type	Qty	Firm Unit price	Calculated price (x firm Unit Price)
1.	2.9m	23	$	$
2.	SB- 1500	11	$	$
3.	1.8m	11	$	$
4.	Sb-98 tideland	4	$	$
5.	1.2 m mobilis	7	$	$
6.	Jet 2500	1	$	$
7.	Jet 5000	1	$	$
8.	Winter spars	13	$	$
	Total			$ CAD

TABLE # 3

Optional year #2

From October, 1er, 2021 to September 30, 2022

Article	Buoys type	Qty	Firm Unit price	Calculated price (x firm Unit Price)
1.	2.9m	23	$	$
2.	SB- 1500	11	$	$
3.	1.8m	11	$	$

4.	Sb-98 tideland	4	$	$
5.	1.2 m mobilis	7	$	$
6.	Jet 2500	1	$	$
7.	Jet 5000	1	$	$
8.	Winter spars	13	$	$
	Total			$ CAD

Total of Table 1, Table 2 et Table 3	**$ CAD**