

**Greater Victoria Harbour Authority**  
For  
**Ogden Point Berth B Mooring Dolphin Project**  
**Addendum 1**

December 4, 2009

**To: Planholders**  
**Transmitted: Four (4) 8 ½”x 11” sheets**

**General**

1. The following revisions are hereby made a part of the Contract Documents. Please acknowledge all Addenda on the Bid Form.
2. Owner-furnished Quick Release Hooks are expected to be procured and available for installation between April 12 – May 3, 2010.
3. Site access / staging yard area and coordination / boom tip lowering at end of work day / lighting on pile before construction is complete
  - Contractor to coordinate site access with Jonathan Griswold at Western Stevedoring, contact (250) 889-5766.
  - Staging and laydown yard area and construction equipment berthing will be on Pier B, with exact area to be determined in coordination with Western Stevedoring after contract award
  - Crane boom requirements during idle hours to be coordinated with Transport Canada Victoria Harbour Master, at contact number given in Contract Documents Contractor shall provide notification to Harbourmaster for all work as he gives notice to aircraft and large vessels like the Coho ferry)
  - Battery-powered white marker strobe lights to be provided at all installed pile/pile cluster locations during limited visibility hours when construction equipment is not present.
4. Quick Release Hook (Item 17 in Base Bid Schedule of Quantities) installation manual is included with this addendum for tenderer information.

**Instructions to Bidders**

1. **Page 3 of 9**

Under:  
3.2.2 Permits

Delete:  
*The contractor shall comply with all regulatory requirements. **In-water work windows are between the dates of December 1, 2009 – February 15, 2010 and July 1 – October 1, 2010.***

Replace With:  
*Permits are in place with the Department of Fisheries and Oceans and Transport Canada, and are attached as Attachment 2 to these documents. All pile driving work must comply with the permits, and the attached Department of Fisheries and Oceans document, titled, **Best***

***Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association - November, 2003.***

***In-water work windows are between the dates of December 1, 2009 – February 15, 2010 and July 1 – October 1, 2010. Pile driving in compliance with the DFO Best Management Practices document may continue throughout the closure period for in-water work, but tenderers are advised that a herring spawn on construction equipment during the closure period will entail a full shutdown of in-water construction until the eggs hatch.***

**Plan Sheets**

**1. Sheet G2 – General Notes**

Under:

Applicable Codes and Standards

Delete:

*5. American Welding Society (AWS), “D1.1 Structural Welding Code – Steel, current edition”.*

Replace With:

*5. American Welding Society (AWS), “D1.1 Structural Welding Code – Steel, current edition” or equivalent Canadian Welding Bureau CSA Standards.*

**2. Sheet G2 – General Notes**

Under:

Steel Welding

Delete:

*All field and shop steel welding shall conform per AWS D1.1 Structural Welding Code – Steel, current edition.*

Replace With:

*All field and shop steel welding shall conform per AWS D1.1 Structural Welding Code – Steel, current edition or equivalent Canadian Welding Bureau CSA Standards.*

Under:

Quick Release Hooks (Owner Furnished)

Delete:

*9. Capstan: Integral with unit, 2 Ton minimum capacity, with rope guide and local motor starter with emergency stop pushbutton and foot switch control. Line speed approximately 1 foot / sec. Contractor shall coordinate with electrical for power supply to capstan.*

Replace With:

*9. Capstan: Integral with unit, 1.5-Ton minimum capacity, with rope guide and local motor starter with emergency stop pushbutton and foot switch control. Line speed approximately 1 foot / sec. Contractor shall coordinate with electrical for power supply to capstan.*

Under:  
Coating Repair

Delete:  
*Repair using Galv-Viz Bar zinc sticks, as manufactured by American Solder & Flux, or spray metalizing to a minimum thickness of 12 miles, followed with a top coat of zinc rich paint.*

Replace With:  
*Repair using Galv-Viz Bar zinc sticks, as manufactured by American Solder & Flux ([http://www.force-industries.com/documents/326-3017\\_000.pdf](http://www.force-industries.com/documents/326-3017_000.pdf)), or spray metalizing to a minimum thickness of 12 miles, followed with a top coat of zinc rich paint.*

3. **Sheet S2 – Piles**

Under:  
Section X-X

Add Note:  
*Backup ring shall be of sufficient height to prevent weld melt-through.*

Under:  
Pile Schedule - Note

Add Note:  
*Note: All piles shall have APF Open End or Inside Flanged Cutting Edge Shoe. Install per manufacturer's recommendations*

4. **Sheet S7 – 120-Foot Catwalk**

Under:  
Typical Section

Add Note:  
*Bearing bars shall be oriented transversely to the walking direction of the catwalk.*

5. **Sheet E1 – Site Layout and Legend**

Under:  
1/E1 Callout note for new conduit from existing junction box to new catwalk:

Delete:  
*1-100mm RPVC c/w 6-1/0 Cu+ Gnd*

Replace With:  
*1-100mm RPVC c/w 3-1/0 Cu+ Gnd*

Under:  
1/E1 NOTES:

Delete:

3. *Install 3-1/0 copper conductors in existing 2-100mm conduits to electrical room.*

Replace With:

3. *Install 3-1/0 copper conductors in existing 2-100mm conduits to electrical room. Existing conduits have existing conductors in place, use existing pull-rope for installation of new conductors. Install new pull-rope at completion of project.*

## 6. **Sheet E2 – Dolphin Detail and Single Line**

Under:

1/E2 NOTES:

Delete:

*Provide connection to 10hp capstan. Capstan complete with starter, disconnects and motor heaters. Starters and heaters by supplier. Disconnect by electrical.*

Replace With:

*Provide connection to 6.6kW capstan. Capstan complete with starter, disconnects and motor heaters. Starter, heaters and disconnects by supplier.*

Under:

2/E2 Single Line

Delete:

*Capstan #1 10 HP.*

Replace With:

*Capstan #1 6.6kW FLA 21.1 amps*

## 7. **Sheet E3 – Specifications and Details**

Under:

ELECTRICAL SPECIFICATIONS

Delete:

18.1 *Provide a new 400A, 120/208V 3 phase 4 wire splitter and 400A, 120/208V 3 phase 4 wire main disconnect switch, as shown in drawings.*

Replace With:

18.1 *Provide a new 40A, 3 pole breaker in a new 125A 3 phase, 4 wire 120/208v panel board as noted in drawings. New panel shall be bolt-on breakers.*

18.2 *Connect new panel to existing meter base and fused switch.*

Delete:

21.2 *Disconnect switches mounted on dolphin shall be NEMA 4X, stainless steel rated for marine environments.*

**End of Addendum 1**

# **Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association - November, 2003**

The BC Marine and Pile Driving Contractors Association and Fisheries and Oceans Canada (DFO) have developed a Best Management Practices Policy for pile driving operations and related activities when working on the water within the province of British Columbia.

The Pile Driving Industry utilizes many different construction methods, equipment and materials in order to complete the contractual obligations for its client. Hammers; including drop, diesel, air, vibratory and hydraulic, vibroflot, and rotary, air and churn drills are the primary instruments in a pile driving operation. These hammers and drills are supported by a wide variety of heavy equipment, including a range of conventional cranes (truck mounted, crawler and pedestal mounted), spud scows, support barges and other water borne equipment. The piling types include treated timber (primarily creosote), concrete and steel (pipe, h-beam and sheet). Construction projects have the potential to utilize a number of different combinations of equipment and materials. It is the purpose of this document to examine the characteristics of each potential combination and develop a Best Management Practices Policy that will meet the following criteria:

- Maximize environmental protection
- Avoid contravention of the Fisheries Act
- Provide construction services economically

## **1)- Basic Rules of Operation**

When in an aquatic environment, contractors will employ the following BASIC Best Management Practices:

- All equipment will be maintained in good proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products.
- Storage of fuels and petroleum products will comply with safe operating procedures, including containment facilities in case of a spill.
- Pile cut-offs, waste or any miscellaneous unused materials will be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown overboard.
- Contractors will have emergency spill equipment available whenever working near or on the water.
- Contractors, where possible, will position their water borne equipment in a manner that will prevent damage to identified fish habitat (i.e. eelgrass). Where possible, alternative methods will be employed (i.e.: use of anchors instead of spuds). In the event that, despite precautions, the contractor is aware that fish habitat has been

inadvertently damaged, the incident must be reported and discussed with DFO to ensure that appropriate action (restoration) is taken.

- Prior to the commencement of any work, the contractor will complete and forward the attached “Notice of Project” to the Department of Fisheries and Oceans. Letters of advice or Habitat Authorizations may be required, depending on the scope of work proposed.
- If contractors are working and a herring (or other fish) spawning occurs, the work will be temporarily suspended and the appropriate DFO contact notified.
- There will be no restriction of work during closure periods (the only exception being when spawning is present, all work must cease and the local DFO habitat biologist must be contacted for further instructions), provided the contractors employ an exclusion device (protective netting or geotextile material suspended in the water column around pile driving area) around the work area to prevent fish access or when required, an effective method of mitigating shock waves (bubble curtain).
- Whenever shock wave monitoring (hydrophone) is performed at a marine construction site and the findings are available to the contractor, the data will be forwarded to the BC Marine and Pile Driving Contractors Association and Svein Vagle at the Institute of Ocean Sciences in Sidney, BC. It is hoped that a database can be built that will more precisely define work procedures and reflect the safest and most economical approach to protecting the fish and their habitat.

## **2)-Timber Piling (creosote):**

When driving timber piling, the following Best Management Practices will be employed to prevent impact to marine fish and their habitat:

- Where possible, new timber piles will comply with the best Management Practices for the use of treated wood in aquatic environments as developed by the Canadian Institute of Treated Wood and the Western Wood Preservers Institute and the DFO document “Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region”.
- Where the above is not possible, creosote piling will stand (weather) for a minimum of 45 days prior to installation.
- These requirements are for new piling only. Reused piling will not normally be subject to any additional treatments (timberfume is a provincially licensed preservative that is available for treatment of used piles), however, pilings with excessive creosote should be avoided. Reuse of suitable piling should be encouraged. In the case of mooring piles, exposed to significant wear, the contractor should encourage the owner to protect the piling with rub strips as per the “Guidelines for use of Treated Wood.
- Timber piling is normally driven using a drop hammer, a diesel/air impact hammer or a small vibratory hammer. Because of the relative small diameter of the timber pile, and its excellent energy absorbing quality, there is little threat of sound pressure impacts to fish and their habitat when driving timber piles.

- Environmental monitoring of sound pressure impacts is not required.
- An attempt should be made to determine whether least impact means full extraction of the piling or if leaving a stub that would not interfere with navigation is acceptable. If complete demolition is required on timber pile structures, the contractor will remove the piling by mechanical means and avoid breaking the piling at the mud line or below. It may be appropriate to cut off the piling flush with the mud line. All demolition operations should be monitored in order to control and contain the construction debris and to determine whether there are any effects on fish or fish habitat.

### **3)-Concrete Piles**

When driving concrete piles, regardless of which hammer is being used, the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

#### Concrete Piles 24 inch diameter and less

- The physical design of 24 inch concrete pile dictates that: 1/ the energy required must be controlled in order to prevent the pile from breaking and 2/ the concrete construction of the pile will absorb the energy. These two factors are expected to result in low level shock wave emission (less than 30 kPa.) and minimal or no effects to fish and their habitat should result.
- Environmental monitoring of sound pressure levels is generally not required.

#### Piles Greater than 24 inch diameter

- When driving concrete piles with a diameter greater than 24 inches using an impact or hydraulic hammer, the following Best Management Practice will be employed to minimize the impact on fish habitat:
- Visual and hydrophone monitoring of the impact on fish by the sound waves emitted will be required. If sound pressures over 30 kPa are measured or a fish kill occurs, the contractor will introduce effective means of reducing the level of the shock waves. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile. This should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventative measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), the work will stop immediately, DFO will be contacted, and the methods will be reviewed and corrected

### **4)-Steel Pipe Piles**

#### Piles less than 18 inch diameter

When driving steel piles 24 inches in diameter and less, regardless of the type of hammer being used, the following Best Management Practices will be employed to prevent impacts to fish habitat:

- Because of the small diameter of the pile it is assumed that the energy required to drive the pile to the final point of installation will not result in shock waves in excess of 30 kPa, therefore, protective measures to reduce shock waves are not expected to be required.
- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected (with consultation with DFO).

#### Piles Greater than 24 inches in diameter

When driving steel pipe piles with a diameter greater than 24 inches using impact or hydraulic hammers, the following Best Management Practices will be employed to prevent impacts to fish habitat:

- Hydrophone and visual monitoring of the effects of the shock waves on fish will be required. If a fish kill occurs, the contractor will introduce effective means of reducing the level of the shockwave. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected (with consultation with DFO).

#### **5)-Steel Sheet Piles and H-piles**

When driving steel sheet piles and H-piles with a drop hammer, an impact hammer or a vibratory hammer, the following Best Management Practices will be employed to minimize the impact on fish habitat:

- It is anticipated that the driving of these types of piles will not generate shock waves in excess of 30kPa, therefore, mitigating measures are not expected to be required.
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- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected (in consultation with DFO).

#### **6)-Stone Column Construction**

When installing stone column using a vibroflot, the following Best Management Practices will be employed to prevent impacts to fish habitat:

- The vibrating action and air flush associated with the operation of the probe results in a high degree of turbidity. When this level exceeds the criteria as outlined in the British Columbia Approved Water Quality Guidelines, the contractor will introduce containment methods that are designed to isolate the contaminated area and to prevent fish from entering the contaminated area. Silt curtains and netting are two methods that can provide the necessary protection.
- When supplying the aggregate to the probe, the contractor will ensure that spillage is prevented, thereby providing additional protection to fish habitat.
- An independent environmental consultant will be used to monitor turbidity levels.

#### **7)-Underwater Drilling and Blasting**

When performing underwater drilling and blasting the following Best Management Practices will be employed to prevent impacts to fish habitat:

##### Underwater Drilling

- Generally, drilling underwater is a process that has very little impact on fish or fish habitat. The procedure does not generate shock waves.
- Contractors will ensure that all attachments (hydraulic connections and couplings) are in good operating order and inspected prior to the start of every day. Spill kits and containment booms must be maintained on-site in case of spills.
- Depending on soil conditions and the potential for turbidity, drill cuttings will be deposited adjacent to the operation, contained on the sea bed or pumped to the surface for deposit into containment skiffs or scows for land disposal when it is determined that the drill cuttings are unsuitable for return to the environment.

##### Underwater Blasting

Contractors required to perform blasting underwater will provide the following protection to prevent impacts to fish habitat:

- Because of the potential for harmful shock waves resulting from a blast, a protection shield will surround the immediate blast area. This would be in the form of an air-induced bubble curtain, which has the primary purpose of absorbing the shock wave and a secondary purpose of preventing fish from entering the blast area.
- In order to protect against flying rock, mats (rubber) will be placed over the blasting area. The placement of the mats may also provide protection for any fish swimming in the immediate area.
- Monitoring of fish movement and concentrations will be conducted using a sounder to determine if fish herding or scaring techniques (seal bombs) can be utilized to reduce the presence of fish in the blast area. If fish scaring techniques are deemed necessary, the DFO habitat biologist or technician responsible for the project must be consulted to determine the risk to fish.

#### **8)-Cleaning out Pipe Piles:**

When cleaning out pipe piles (i.e.: air lifting) the following Best Management Practices will be employed to prevent impacts to fish habitat:

- Generally, sediment contained in the pipe is will be pumped to the surface and processed through an approved containment system and disposed of at an approved landfill site.
- If the contractor knows that the sediment is toxic, the sediment must not be redistributed in the area. If the sediment is non-toxic, and if fish are not present in the area, and adjacent fish habitats are not a concern (contact DFO) it may be acceptable to:
  1. Pump the sediment through a discharge tube and allow it to settle in the immediate area with or without a silt curtain to contain the sediment.
  2. Pump the sediment through a discharge tube and additional flex hosing and redirect it back to the base of the pile.

#### **9) Containment of Concrete Residue and Water Run Off**

When placing concrete in form work over or in water, the following Best Management Practices will be employed to prevent the impacts to fish habitat:

##### Pouring concrete

- Spills: When pouring concrete all spills of fresh concrete must be prevented. Concrete is toxic to fish due its high pH. If concrete is discharged from the transit mixer directly to the formwork or placed by wheelbarrow, proper sealed chutes must be constructed to avoid spillage. If the concrete is being placed with a concrete pump, all hose and pipe connections must be sealed

and locked properly to ensure the lines will not leak or uncouple. Crews will ensure that concrete forms are not filled to overflowing.

- Sealing forms: All concrete forms will be constructed in a manner which will prevent fresh concrete or cement-laden water from leaking into the surrounding water.

#### Curing concrete

- When fresh water is used to cure concrete, the run off must be monitored for acceptable pH levels. If the pH levels are outside the allowable limits then the run off water must be contained and neutralized.

#### Grinding concrete

- When grinding cured concrete, the dust and fines entering the water must not exceed the allowable limits for suspended solids. When grinding green or incompletely cured concrete and the dust or fines are entering the water, pH monitoring will be conducted to ensure allowable ranges are maintained. In the event that the levels are outside the acceptable ranges, preventative measures will be introduced. This may include introducing silt curtains to contain the solids and prevent fish from entering a contaminated area or constructing catch basins to recover the run off and neutralizing it prior to disposal.

#### Patching concrete

- Spills: When patching concrete, all spills must be contained and prevented from entering the water.

#### Washing hand tools, pumps and transit mixer

- All tools, pumps, pipes, hoses and trucks used for finishing, placing or transporting fresh concrete must be washed off in such a way as to prevent the wash water and excess concrete from entering the marine environment. The wash water will be contained and disposed of upland in an environmentally acceptable manner.

Whenever there is the possibility of contaminants entering water, the contractor will monitor pH levels to ensure acceptable levels.

**APPENDIX**

Fisheries and Oceans Canada

Contact List

Name	Telephone No.	Fax. No.
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**NOTICE OF PROJECT**

Project Location:

To: Fisheries and Oceans Canada    Attention:

Telephone/Fax/email: \_\_\_\_\_

From: "Contractor"

Telephone/Fax/email: \_\_\_\_\_

Representative:

Please be advised of the following marine/pile driving project:

Project Name:

Project Location:

Project Manager/Superintendent:

Project Telephone/Fax/email: \_\_\_\_\_

Project commencement date:

Project Information:

Type:            Bearing                      Fender                      Mooring

Number of Piles:

Pile Diameter (if steel)

Type of Driving:    Vibro Drop Hammer \_\_\_\_\_

Special Conditions at the Bottom (use of pins, sockets, epoxy, concrete, other)

\_\_\_\_\_

General Equipment On-Site (barge, truck, crane, etc.) \_\_\_\_\_

Signature of Contractor: \_\_\_\_\_

Date: \_\_\_\_\_

## 2.0 Installation of anchor bolts / mooring units on Steel deck with counter plate and insulation hardware

### 2.1 Installation of units with counter plate

Place the unit complete with counter plate in the correct position. See sketch -1- on other page.

Consult the appropriate drawing(s) before installation of the unit complete with counter plate onto the deck structure!!

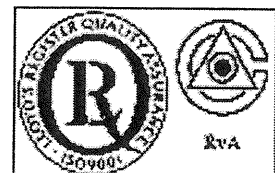
Brush the deck surface and take care that the surface is levelled, flat and dry. Place and fixate the counter plate position such that they cannot move during welding, by tackwelds. Remove anchor bolts washers. Lift off the unit from the counter plate and store on a safe place protected from welding damage when counter plate is being welded onto the steel deck. Cover thread holes during welding procedure. After welding of the counter plate repair paint damage (see chapter 6). Clean the thread of the thread holes and anchor bolts thoroughly.

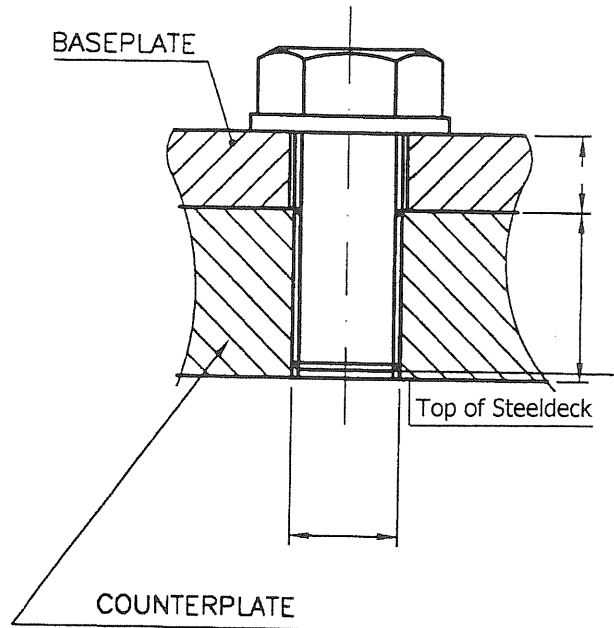
### 2.2 Installation of Quick Release Mooring units

Place the Quick Release Mooring unit on the counter plate in the correct position over the anchor boltholes in place. First place the steel washers and anchor bolts. Tighten the anchor bolts approximately with a torque as prescribed in sketch -2- on other page. Protect the washers and anchor bolt studs by means of an additional coating or grease against weather conditions.

When the above-mentioned sequence is not followed up correctly **Mampaey® Offshore Industries B.V.** cannot guarantee the proper functioning of the electrical components and insulation function of the insulation hardware if these components are applicable for this mooring unit.

Procedure number	: Reference to 05	Revision number	: Rev 3
Review by	: QAM	Change review by	: QAM
Approved by	: TM	Change approved by	: TM
Date approval	: 26 July 2000	Date change approved	: 17 October 2001
Number of pages	: 24	MOI-file	: manual

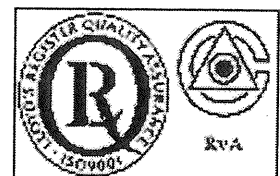




Maximum Torque table in Nm ( 1 kgfm = 10 Nm)	
Anchor bolt metric size M48	<p>Prescribed Torque :</p> <p>1000 Nm and add 90° of a turn</p> <p>use</p> <p>a torque wrench and a impact spanner</p>
Anchor bolt metric size M56	
Anchor bolt metric size M64	
Anchor bolt metric size M72	
Anchor bolt metric size M80	
Anchor bolt metric size M90	
Anchor bolt metric size M100	
Anchor bolt metric size M110	

Procedure number : Reference to 05  
 Review by : QAM  
 Approved by : TM  
 Date approval : 26 July 2000  
 Number of pages : 24

Revision number : Rev 3  
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 Change approved by : TM  
 Date change approved : 17 October 2001  
 MOI-file : manual



### 3.0 Electrical Installation Instructions (not in scope of work)

#### 3.1 Precautions

Electrical installation to be carried out by qualified personnel according to AS-BUILT drawings. Powering of the system should preferably be carried out in presence of our Commissioning Engineer. In case the client starts up commissioning procedures without the supervision / presence of a Mampaey® Commissioning Engineer, Mampaey® **cannot** be held responsible for any malfunctions or damages which occur during or after the commissioning services.

#### 3.2 Instructions for electrical connecting works

Before connection works may start, all cables **must** have had their insulating values measured and there should be a report present, which shows the values recorded. After the connection works cables are to be tested for continuity and ticked off on the diagram. A report of former mentioned actions should be made and present at site during commissioning services.

##### 3.2.1 Electric rotation field direction and heaters

Please check rotation field direction of the local power supply - at all times - it must be a **clockwise** field rotation direction. By means of connecting power to the system internal heaters are activated to keep enclosures / motors temperature conditioned and to protect against moisture inside these enclosures / motors.

**Maintain** power connected during entire installation works, commissioning services and during operation, even when the Quick Release Mooring Unit is not in use!!

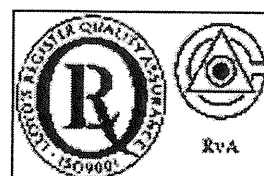
Close enclosures properly with all bolts and apply on both flanges of the explosion proof enclosures / motors / footswitches and junction boxes, for instance Never Seez (Marine Grade). Apply grease in such a way that during closing the lid and tightening the bolts grease is forced to the outside of the flanges. Clean remaining grease from circumference of the flanges. Always apply new grease after opening electrical enclosures, footswitches and junction boxes. It is **not allowed** to keep enclosures, footswitches and junction boxes open!! Cable glands should be fitted complete with the correct cable or plugged.

If above procedure is not done properly Internal Protection shall decrease to IP 44!!

The electrical equipment is protected in the following manner:

- The level of mechanical protection of all materials is a minimum of IP 55 for the motors, for the outdoors switching equipment and for the footswitch.

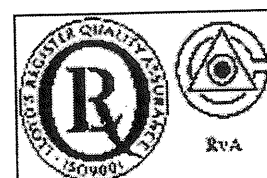
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Number of pages	: 24	MOI-file	: manual



### 3.3 Checklist before commissioning

- 1- Reports of insulating values ('megger'-testing) and continuity of cables to be checked and present at site. Measuring the insulation values of the cables can only be done while cables are not connected to the electrical components.
- 2- All electrical connections are to be checked to ensure that they are well secured into their cable connectors (cable-ferrules) and into their destined terminal. Cables should be insulated from each other and each cable should be numbered according to its destined terminal number.
- 3- Before the installation may be switched on, the supply voltage and the fuse value of the supply should be checked.
- 4- As described above, field rotation direction should be checked and should - at all times - be clockwise. **(Phase sequence: right handed)**

Procedure number	: Reference to 05	Revision number	: Rev 3
Review by	: QAM	Change review by	: QAM
Approved by	: TM	Change approved by	: TM
Date approval	: 26 July 2000	Date change approved	: 17 October 2001
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To check rotation field direction follow below described sequence.

- A- Open all fuse holders and automatic devices inside the motor starter;
- B- Connect the power supply cable;
- C- Check voltage of the three phases of the power supply;
- D- Check rotation field direction of the power supply;
- E- Close all automatic devices and fuse holders and check the secondary voltages.

Carry out the above steps for all motor starters.

If above instructions have been carried out correctly, the system may be switched on, notice precautions as mentioned in section 3.1.

**Special note:**

There is a number of circumstances, which should be considered during installation, or replacement of several parts in explosion-hazardous areas:

**Earthing**

The mooring units must be installed in such a way that it is insulated from the deck structure and it must also be insulated from the electrical earth connection. This is necessary in connection with possible static charges, which could possibly cause sparks and thereby lead to an installation being damaged. We therefore provide and install insulation material between capstan / motor-starter and unit. An insulation plate to install between unit and deck by customer is delivered separately.

Procedure number	: Reference to 05	Revision number	: Rev 3
Review by	: QAM	Change review by	: QAM
Approved by	: TM	Change approved by	: TM
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